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ISSUE 17, 2016

THEMATIC ISSUE:
ECONOMIC REGULATION, REGULATORY PERFORMANCE AND UNIVERSAL ACCESS IN THE ELECTRONIC COMMUNICATIONS SECTOR

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Issue 17, 2016

Thematic Issue:
Economic Regulation, Regulatory Performance and Universal Access in the Electronic Communications Sector

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Thematic Overview: Economic Regulation and the Development of Telecoms, Mobile Money and Banking

Simon Roberts
Professor of Economics and Director, Centre for Competition, Regulation and Economic Development (CCRED), University of Johannesburg; and AJIC Guest Editor

Abstract
This thematic overview for *AJIC* Issue 17 discusses the lessons emerging from studies of electronic communications access, innovation and regulation in a selection of African countries including Kenya, Nigeria, South Africa, Uganda, Tanzania and Zimbabwe, with particular emphasis on digital financial services.

Keywords
economic regulation, telecoms, mobile financial services, complexity in policy and regulation, Southern Africa, East Africa, Nigeria, United States, China

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1. Introduction

This thematic issue of *The African Journal of Information and Communication* (*AJIC* Issue 17) brings together scholarly contributions on a range of topics relating to access to telecommunications, the regulation of telecommunications and the development of digital financial services. It includes a particular focus on the development of mobile money in Southern and East Africa. East Africa has led in the adoption of mobile money transfer services, where mobile network operators enable the transfer of funds between individuals. The services have extended to merchant payments and bill payments, such as for utilities. More recently, since around 2013, arrangements have enabled mobile banking to take off in some countries, as part of the broader range of digital financial services. This raises questions about the extent of access and service provision. While the range of services can provide enormous opportunities to communities for economic activity and market linkages, as well as to facilitate the delivery of health and education services, this depends on whether the telecommunications infrastructure is in place, whether fixed or mobile.

The policy and regulatory issues cut across telecommunications and finance, meaning that they straddle the areas of responsibility of different regulators and government departments. There are also questions of consumer protection and competition. Building a common understanding of the issues is an important process in grappling with the regulatory challenges, especially given the complex and dynamic nature of these markets.

2. Market structure, competition dynamics and pricing

In this thematic issue, Robb and Vilakazi compare developments in three countries where mobile money transfer has taken off, namely Kenya, Tanzania and Zimbabwe. The comparison of the market structure, competition dynamics and pricing in mobile payments markets in the three African countries shows that where there is a dominant incumbent, as in Kenya and Zimbabwe, tariffs for mobile payments tend to be higher and there is a wider gap between the charges for registered and unregistered customers. This is consistent with the predictions of economic theory in network industries and the incentives of incumbent operators to capture or tip the market in their favour. By attracting customers to the dominant network and making switching unattractive, the pricing bolsters the incumbent's market power. All three countries have competition authorities and action has been taken by the authorities in Zimbabwe and Kenya. Tanzania, by comparison, has seen the Central Bank nurturing the development of the services using a soft touch and moral suasion, backed by its considerable powers. The competition issues have been minimised by the regulatory actions, which have ensured that three vigorous rivals have been maintained in the market and no one company has unilateral market power.

3. Regulatory issues in mobile financial services

Two articles, one by Mazer and Rowan and the other by Blechman, narrow in on

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Kenya and Tanzania and offer comparative insights. Mazer and Rowan consider the access channel for mobile financial services, transparency in the pricing and terms of the services, interoperability and the sharing of credit data. Blechman undertakes an in-depth analysis of the specific challenges of mobile credit. Mazer and Rowan find that channel access through unstructured supplementary service data (USSD) is especially important for competitive rivalry in mobile financial services. By using USSD, a range of providers can offer services over mobile channels. However, the mobile network operators (MNOs) control USSD. With rivalry between the MNOs, they are incentivised to offer reasonable terms to attract customers, as in Tanzania. With unilateral market power on the part of one provider, as in Kenya, then USSD access can be charged at high prices and those offering services, which do or may compete with the MNOs mobile financial services offering, can effectively be blocked. Enforcement action, whether by the competition authority or the regulator, is likely to be required. There are similar issues relating to transparency. Mazer and Rowan find that a lack of transparency hinders competition, through increasing search costs and making comparability more difficult. This warrants action under the consumer protection provisions of national laws and regulation.

Interoperability is a crucial step in smaller competitors being able to attract subscribers, as these subscribers are then able to link with subscribers on the larger networks. However, starting with interoperability from the outset reduces the incentives for the first mover to invest in the network, as followers will be able to access the network without making their own investments. As the networks mature, the market power of the dominant network becomes an important concern and interoperability needs to be achieved. Mazer and Rowan describe how Tanzania has achieved interoperability through negotiations between the main providers, under the guidance of the Central Bank. Tanzania also issued guidance against agents being signed up on an exclusive basis. In each of these areas, Tanzania differs from Kenya and provides an important example for other countries. In Kenya, agent exclusivity was only achieved as a result of a settlement with the Competition Authority of Kenya.

Of course, interoperability, or interconnection, when we consider telecommunications networks, needs to pay attention to off-net or call termination charges. Substantial charges mean there is a differential charged for calling or transferring to someone on another network and can mean that, while there may be technical interoperability, the penalty on consumers is such that it changes their behaviour in practice. The thematic report by Hawthorne analyses the effects of the decision to reduce mobile call termination rates (MTRs) in South Africa. While the incumbents had claimed little would result from the change in MTRs, the outcome was very substantial, since the more effective rivalry from the smaller networks, as a result of lower MTRs, forced the two large MNOs to compete, through lowering headline call charges (especially on pre-paid calls) to the advantage of consumers. Thus, regulation is important to support competitive rivalry.

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Blechman undertakes an in-depth analysis of the specific challenges of mobile credit in Kenya and Tanzania, where mobile money transfer services are ubiquitous. Mobile credit allows consumers to apply for loans over mobile devices and enables the extension of financial services to otherwise unbanked populations, such as small-holder farmers and informal traders. As mobile credit grows it raises a number of regulatory challenges, especially as it cuts across different regulatory frameworks. Blechman identifies challenges in prudential regulation of the financial system, economic regulation to address market failures and consumer protection regulation to ensure consumers are informed, especially with a view to the potential for vulnerable consumers to rack up debt.

4. Further considerations in formulating policy and regulation

It is important that policymakers and regulators ensure an enabling environment that incentivises innovation and investments in these new products and the underlying technologies that drive them. A critical consideration in the mobile credit offering is ability to evaluate risk. Blechman considers the importance of information from money transfers as an important source of data on subscribers' behaviour, which can be used in credit extension, as it enables an individual's track record to be built up from mobile credit data. However, the credit record is controlled by the mobile money service provider. As of 2016, there is a regulatory patchwork in Kenya and Tanzania, with many gaps with respect to this data. In particular, according to Blechman, mobile credit data needs to be included in credit reporting systems, in a way which furthers the policy goals, without exploding the costs of mobile credit or unfairly punishing the financially uneducated for mistakes.

The article on Uganda, by Macmillan, Paelo and Paremoer, complements the studies on Tanzania and Kenya, by considering the development in a country, which is rapidly catching up with its neighbours in adoption of mobile money. Macmillan et al. assess the effect of "light touch" regulation on the competitive dynamics of Uganda and contrast this with the experience in Tanzania, where regulation evolved from light touch regulation to a fuller framework as the sector grew. In Uganda, one firm has established a substantial lead position in mobile money and Uganda is certainly an example of mobile money take-off under an MNO led model. Light touch regulation incentivised the rapid expansion in services by the lead firm, as it could reap the rewards of its investments, with its market power practically unchecked. However, the dominant player in such a situation has the incentive to foreclose any rivals and maintain relatively high prices, both of which actions can stifle the growth of the services. Macmillan et al. identify a number of potential competition issues, which require attention. While Uganda has not had a competition authority, the Communications Act gives the Uganda Communications Commission the authority to regulate an extensive range of competition issues in the telecommunication sector. The Central Bank also issued non-binding mobile money guidelines in 2013. In addition, under private litigation, the dominant firm has been found to have

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unlawfully blocked a smaller rival, although as at December 2016 this was still under appeal.

The Uganda case thus provides a good example of the regulatory challenges and of the benefits from mobile money. The recent proliferation of mobile financial services in developing countries has increased access to financial services among underserved rural and low-income populations. While these new services have the potential to further promote financial inclusion, they also raise novel regulatory issues and do not fit neatly into pre-existing regulatory categories. This is due to the novel nature of mobile credit and the variety of entities and regulatory frameworks implicated in the business models found in these two markets. Policymakers and regulators will need to make choices about how to regulate mobile credit, with respect to consumer protection, credit reporting and the availability of mobile and mobile money services transactional data, a key input for credit evaluation decisions. These choices will need to take into account promotion of financial inclusion and protection of consumers, without creating disincentives for innovation and investment.

By comparison with the three East African countries, South Africa has not seen mobile money take off, and financial services, such as credit, remain dominated by traditional banks. Makhaya and Nhundu consider the barriers to entry in banking through the eyes of a successful entrant in South Africa, Capitec Bank. The experience highlights the range of obstacles to effective rivalry. These obstacles range from the considerable time required to build the customer base, brand awareness, a branch network (in the absence of mobile money and branchless banking) to regulatory hurdles. The article also highlights the benefits of entry and the resultant competition in the retail banking sector, which had been dominated by four major retail banks. Significantly lower bank charges resulted, and Capitec's entry sparked competition in low cost bank accounts and facilitated better services for low-income clients and enhanced financial inclusion. Makhaya and Nhundu identify a number of aspects that can still be improved in the regulatory framework, such as to facilitate switching and to support innovation, while, of course, effective bank supervision is essential for prudential reasons.

The contribution by Bello, Opadiji, Faruk and Adediran highlights the challenges and opportunities on the ground for rural and remote communities in Nigeria. Their survey of 15 rural communities emphasises the importance of improving access. Four of the communities have no access to telecommunications services, while the remaining 11 have access, but it is relatively poor in terms of the quality of reception. Bello et al. highlight the substantial benefits, which would be realised from improved access, drawing from literature and the survey of the 15 communities. The benefits include farmers having better information about markets and being able to link with customers, as the Agric Mobile Phone Xchange in Nigeria is doing. There are also future benefits in education and community healthcare service delivery, where

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rural healthcare centres can be linked to central facilities to obtain information and primary healthcare support, and provide data to monitor disease incidence. The survey identified perceptions of where improved telecommunications services would bring benefits with relationships with friends, family support networks and better neighbourhood security topping the list. This was followed by better education opportunities and health. Interestingly household income, business opportunities and the quality of government services were rated much lower.

The differing approaches to telecommunications policy and regulation are starkly illustrated by Sutherland's comparison of the Washington consensus policies of privatisation and liberalisation promoted in Africa, against the alternative approach of China. African countries largely have tight private oligopolies or a single dominant firm. By comparison, China has maintained state-ownership in telecommunications, while encouraging competition amongst a number of market participants. Sutherland notes that China is becoming more engaged in African countries, through supporting network upgrading and other operations. This raises the question whether African countries can and should "look east" for different models of telecommunications policy and regulation, as well as support for infrastructure investment.

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ARTICLES



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Mobile Payments Markets in Kenya, Tanzania and Zimbabwe: A Comparative Study of Competitive Dynamics and Outcomes

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Abstract
This article aims to contribute to a better understanding of the competitive dynamics in mobile payments markets and the implications for consumers. We do this by conducting a comparative review of market structure, competition dynamics and pricing in mobile payments markets in three African countries. The results show that, where there is a dominant incumbent, tariffs for mobile payments tend to be higher and reflect a wider gap between those for registered and unregistered customers. This is consistent with the predictions of economic theory in network industries and the incentives of incumbent operators to capture or tip the market in their favour, which also contributes to reducing switching by existing customers in the market for mobile services.

Keywords
mobile payments, markets, competition, Kenya, Tanzania, Zimbabwe

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1. Introductory remarks on African mobile payments markets

Mobile payments have revolutionised the payments system for consumers in a number of African countries, providing a cheap, safe and convenient means of transferring money. This is beneficial for competition, as it provides the consumer with a cheaper alternative to banks and other financial institutions with a much wider footprint. Furthermore, mobile money services have evolved to offer a wider range of services, such as savings and credit products, adding further value for consumers. The possibility for competition in the provision of mobile payments, in particular to bring benefits to consumers, is illustrated by recent developments in Kenya, where increased competition in the market appears to have led to falling prices.

However, in some countries, telecoms companies have established positions of significant market power in the mobile payments market, in addition to existing incumbent positions in the market for traditional mobile network operator (MNO) services. This raises a concern that incumbent firms will engage in strategies to reinforce their dominance in both markets, particularly given the network effects present within and across them. This has been borne out in a number of competition complaints against incumbent mobile money providers in different countries. Although in the short term it does appear that MNOs are involved in rapidly developing adjacent products and services, leveraging the high penetration of mobile payments services, a lack of competition in the long term may reduce the incentive for further innovation and product development and lead to higher prices.

Three competition issues have been highlighted across Kenya, Zimbabwe and Tanzania, which we focus on: firstly, the impact of agent exclusivity on the ability of rivals to compete; secondly, allegations of margin squeeze by dominant MNOs, who provide unstructured supplementary service data (USSD) infrastructure to other potential mobile payments providers such as banks; and, thirdly, the limiting of interoperability, for example through higher charges to recipients on a different network, to reinforce network effects and maintain dominance. Underlying all of these types of conduct is the incentive for a dominant incumbent to maintain its dominance in the mobile payments market and the linked benefit in terms of inducing customer loyalty in the market for traditional MNO services.

In terms of interoperability, Motta (2004) (based on Cremer, Rey and Tirole (2000)) show that, in a market with network effects, where there are two firms with asymmetric market shares, the larger firm will not prefer compatibility with rivals, unless its installed base is small relative to potential demand. We extend this model to consider the case where firms have symmetric market shares and show that in this scenario, firms would prefer compatibility. Our analysis finds that, for the most part, these predictions are borne out in the three countries studied. Incumbent firms with a large installed base appear more likely to resist interoperability and find it in their interest to maintain their own proprietary system and even raise barriers to transacting

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across networks. By contrast, where firms' market shares are more symmetrical, they are more likely to agree to compatibility, tariffs are lower and tariffs to registered and unregistered users are identical. This suggests that, in markets where there is substantial asymmetry in market share and one firm has established a very strong position, some regulatory intervention may be required in order to ensure better outcomes for consumers.

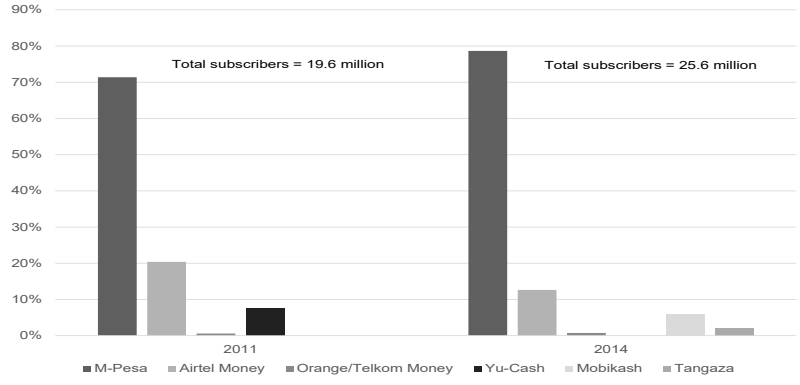
The article is structured as follows: Section 2 introduces the market structure in the mobile payments markets in Kenya, Zimbabwe and Tanzania. Section 3 reviews the benefits which mobile money has brought to consumers in each country. Section 4 introduces theory on competition dynamics in network markets before discussing three competition concerns which have arisen in the mobile payments markets in Kenya and Zimbabwe. Section 5 analyses interoperability and pricing outcomes in Kenya, Zimbabwe and Tanzania and relates this to the relevant theory. Finally, Section 6 presents concluding remarks, policy implications and areas for further research.

2. Mobile money market structure in Kenya, Zimbabwe and Tanzania

Kenya

The mobile money market in Kenya is the most developed in Africa, where it has 26.3 million subscribers (Communications Authority of Kenya, 2016). As illustrated in Figure 1, the mobile money market is highly concentrated, with the dominant firm Safaricom enjoying over 70% of the market in terms of subscribers. Recently, there has been entry by some new small players, but it seems that until 2014 at least, this did not dent M-Pesa's dominance in the market. Rather Safaricom's M-Pesa is becoming more popular over time, growing its market share between 2011 and 2014 from just over 70% to almost 80%, suggesting that it is winning most new subscribers.

Figure 1: Market shares by mobile money subscribers in Kenya, 2011 and 2014

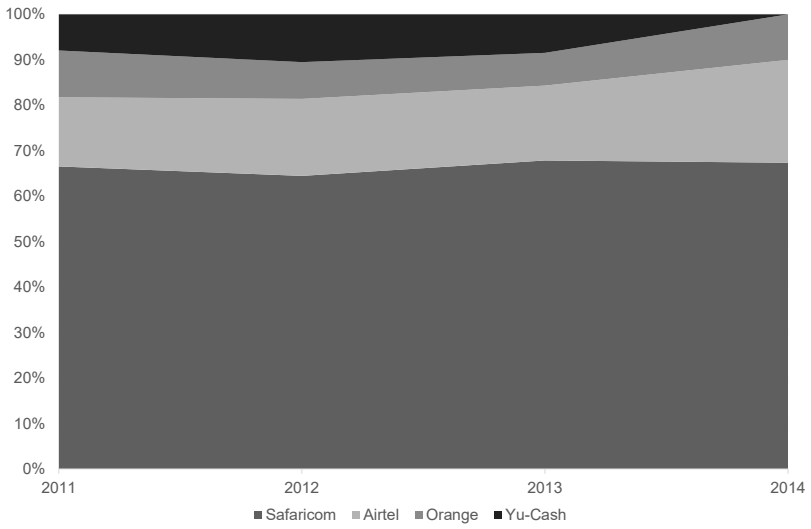


Source: Michaels (2011), Communications Authority of Kenya (2011-2014)

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Figure 2 illustrates that Safaricom is also dominant in the MNO market in Kenya, where it had a market share of between 60% and 70% from 2011 to 2014. Safaricom's market share has been very stable, suggesting that little customer switching has occurred. Whilst the market share of Airtel, Safaricom's main competitor, grew over the same period, it did so at the expense of other smaller competitors, not Safaricom.

Figure 2: Market shares by mobile subscribers in Kenya, 2011-2014



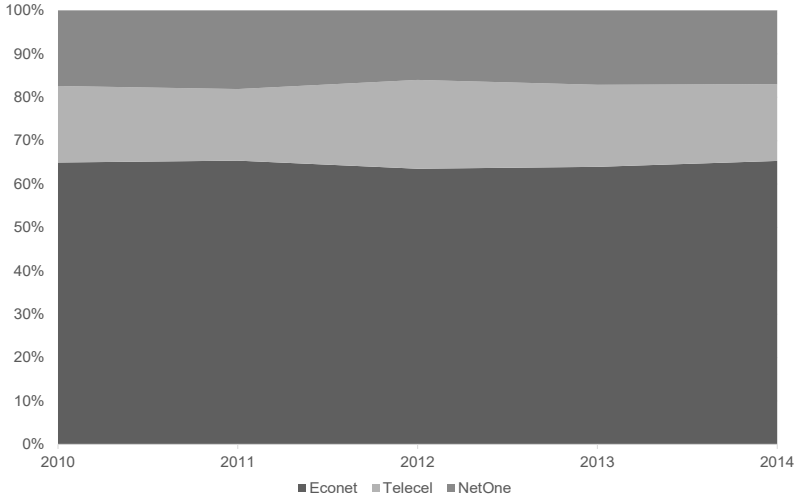
Source: Communications Authority of Kenya (2011-2014)

Zimbabwe

The structure of the Zimbabwean mobile market is even more extreme than that of Kenya. In Zimbabwe, three MNOs are operating, all of which have a mobile money platform. However, the market is heavily dominated by Econet and its mobile money platform, Ecocash. Figure 3 below illustrates that Econet had around 65% of the MNO market in terms of subscribers between 2010 and 2014, with very little variability in market shares. The other two competitors NetOne and Telecel share the rest of the market between them.

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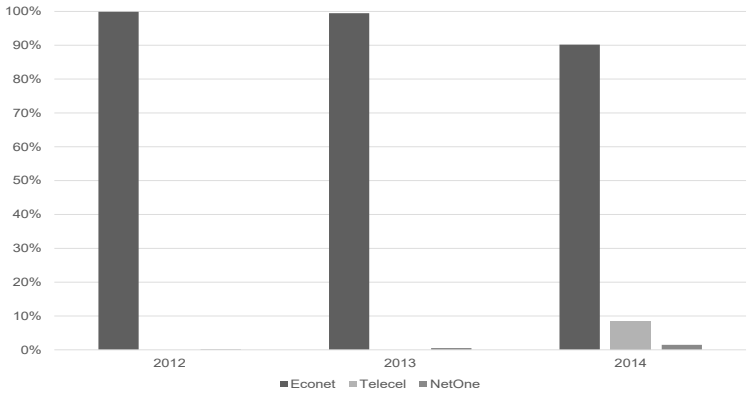
Figure 3: Market shares by mobile subscribers in Zimbabwe, 2010-2014



Source: POTRAZ (2012-2016)

Figure 4 illustrates that, even more than M-Pesa, Ecocash is a virtual monopoly in the mobile money market. Encouragingly, Telecash quickly gained around 8% in terms of subscriber market share on re-entering the market in early 2014,[1] however, in terms of transaction value Telecash's market share is much smaller (POTRAZ, 2014) and Ecocash still clearly dominates the market.

Figure 4: Market shares by mobile money subscribers in Zimbabwe, 2012-2014



Source: POTRAZ (2012-2016)

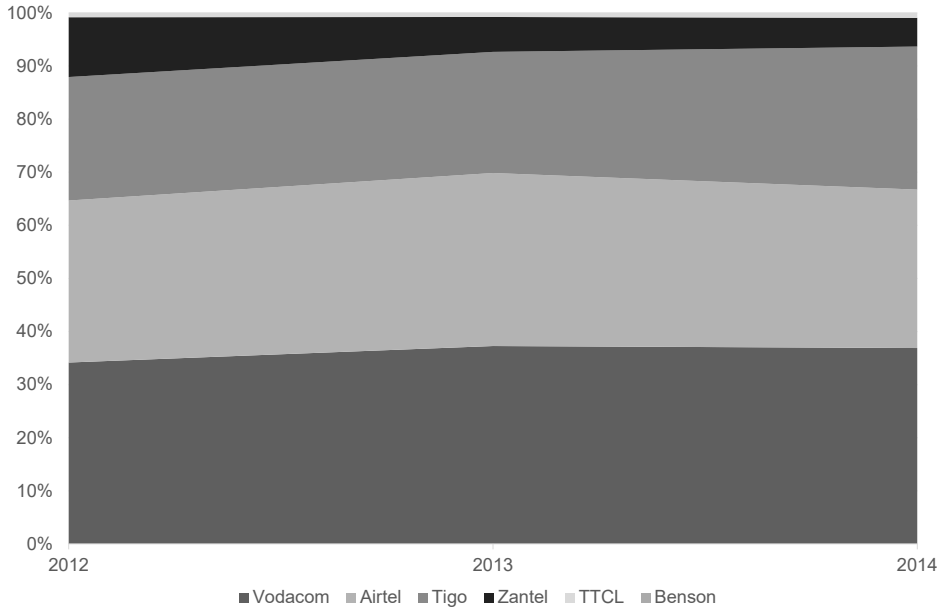
1 Telecel had initially introduced a mobile money product, Skwama, in January 2011, using a bank-led model in partnership with Kingdom Bank. However, Telecel subsequently withdrew the product due to concerns that partnering with a single bank was limiting its potential growth.

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Tanzania

The Tanzanian market is somewhat different to those in Kenya and Zimbabwe. Tanzania has a much more competitive MNO market than either Kenya or Zimbabwe, as illustrated in Figure 5. There are three players each, with around 30% of the market and a few small fringe players.

Figure 5: Market shares by mobile subscribers in Tanzania, 2012-2014

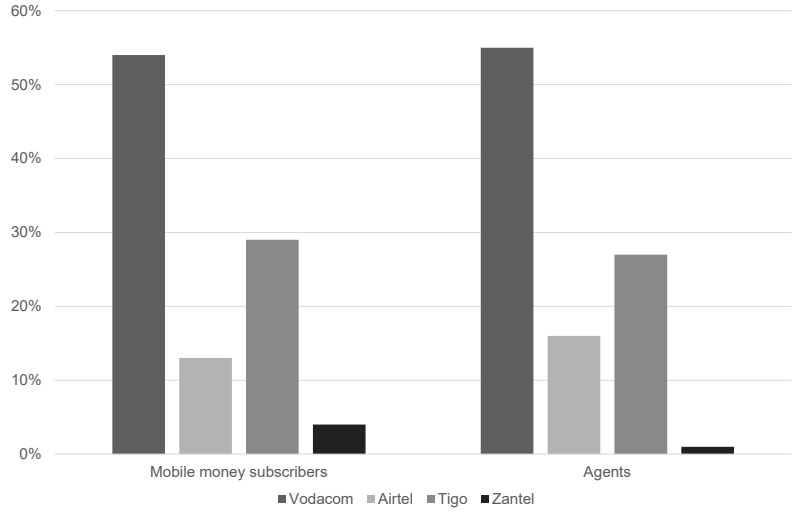


Source: TCRA (2012-2014)

For mobile money, Vodacom is bigger in terms of active wallets than the other two main players, with a 54% market share in 2014 (CGAP, 2014). Thus, although the Tanzanian market appears to be more competitive than the Kenyan and Zimbabwean mobile money markets, there is still only one large player, which is almost twice the size of its nearest rival (Figure 6).

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Figure 6: Market shares by active wallets and agents in Tanzania, 2014, 2013



Source: CGAP (2014); Helix Institute of Digital Finance (2013)

3. The benefits of mobile money to consumers

It is widely accepted that mobile payments yield substantial benefits to consumers, not least because of the ability of these payment mechanisms to offer a secure, cheaper and more convenient method for people, particularly in poor or rural settings, to send and receive money (Klein & Mayer, 2011). This includes the ability to bring people that were previously not catered for under traditional payment systems into more formal systems of transacting. This contributes substantially to increasing financial inclusion. A key component driving the penetration of mobile money and electronic payments in general, across several countries, is the ability of these platforms to disaggregate, or unbundle, the services traditionally offered by banks into less expensive and accessible platforms (Klein & Mayer, 2011; Zollmann & Cojocaru, 2015). These developments are especially important in the Zimbabwean setting, following the period of economic hardship in the mid-2000s, wherein most people developed a significant distrust for formal banking systems and reverted to using largely cash-based methods and direct, informal cash transfer mechanisms, such as through mini-bus taxi services and travelling relatives or friends (Dermish, Hundermark & Sanford, 2012).

Mobile payments systems largely compete with formal mechanisms offered by banks, as well as cash-based and informal systems. The former is a dynamic growth area in terms of competition, in so far as MNOs have drawn in people who were previously unbanked, as well as some proportion of traditional bank clients. In turn, banks increasingly offer mobile banking and mobile money as value-added services to their customers, although this relies on the infrastructure of mobile operators.

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From a competition perspective, there is clearly some overlap in the customers of banks and MNOs in particular, as well as a degree of imperfect substitution between these services and informal mechanisms of sending and receiving money. A key determinant of the extent of this rivalry is accessibility, for example in terms of agents, cash-out facilities and price. Bank services have traditionally been perceived to be expensive (Dermish et al., 2012; Zollmann & Cojocaru, 2015), and informal transfers less reliable and convenient. Importantly, the parameters on which competition between these modes takes place extends beyond price, to aspects of quality of service such as safety, reliability, convenience and accessibility. For example, 65% of respondents in a FinScope survey of individuals in Zimbabwe said that they used mobile money largely for sending and receiving money, because it was most convenient (in terms of time taken); while 36% considered that it was cheap; 24% that the service was trustworthy; with 23% saying that mobile money was the only service available in their area (FinMark Trust, 2015). However, to the extent that consumers are willing to pay a non-trivial amount for a more convenient and safe service relative to informal mechanisms, and in so far as tariffs for mobile money are below those of banks, the price level set by operators remains critical and a key strategic lever.

While the data were not available to assess the degree of substitutability at the margin, say for a small but significant and non-transitory increase in the tariffs charged by mobile money providers (which would bring the price closer to those of banks and make it more expensive for those formerly using informal modes), there are some insights to be drawn from recent developments in each of the markets we consider.

Kenya

In 2014, the Communications Authority of Kenya provided three new mobile virtual network operators (MVNOs) with licences, namely Finserve (owned by Equity Bank), Zioncell Kenya (a subsidiary of Mobile Decisioning), and Mobile Pay (backed by Tangaza Pesa), which allow them to provide mobile money services using their own sim cards and without necessarily rolling out their own infrastructure. Publicly available information suggests that the entrants have entered into arrangements with Airtel Kenya to use their 60% excess capacity (Equity Bank, 2014).

Most relevant here is the fact that, around the time of this announcement by the authority, Safaricom announced new tariffs, which took effect on the 21 August 2014 (Nleya & Robb, 2014). Safaricom introduced tariffs that were 67% lower for transaction values of KES10-1500, while withdrawal fees remained unchanged and tariffs for amounts above KES1500 would be an average of 0.8% of the transaction value (Safaricom, 2014). This seemed to follow Equity Bank's own announcement that their pricing strategy, upon entry, would be aggressive and seek to undercut, significantly, the prevailing prices for money transfer in the market (Equity Bank, 2014).

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The fees that Equity Bank has proposed are lower than their own retail banking rates on the Equity Bank Ordinary Account product.[2] Setting aside the requisite opening balance for opening an account of KES400, Equity Bank charges KES150 for an ATM cash withdrawal; KES100 for an electronic fund transfer (EFT) to an Equity Bank account holder; and KES300 for an EFT to a customer of another bank. However, its proposed transfer fees for mobile money range from KES1.00 (for KES100 transfer) to a maximum of KES25.00 irrespective of the amount transferred (Equity Bank, 2014).

Although low entry price strategies are common for new entrants seeking to gain market share and, while it is not clear that Safaricom's announcement is a direct response to the impending entry of rivals, it is significant that the operators have presented significantly reduced prices. For Equity Bank and Finserve, the ability to offer reduced prices is likely linked to the ability to leverage existing infrastructure to connect Equity Bank's more than nine million banking customers to mobile money mechanisms, through Airtel, whilst offering an even wider range of related financial services. In the case of Safaricom, it is likely that the new pricing strategy is in response to entry and may be geared to capture a portion of the growing market and reduce the ability of entrants to gain share. Even if this is not the intention of the strategy, it may still have this effect.

Equity Bank has also announced that it would have access to a network of 11,000 agents to facilitate its entry (Equity Bank, 2014), which is due in part to the Competition Authority's intervention on agent exclusivity in the market in 2014, which we return to below. Increased access to agents for cash-in and cash-out transactions enhances benefits to consumers, as well as welfare to businesses operating as agents.

Zimbabwe

In Zimbabwe, Ecocash has, on a number of occasions, had to reduce tariffs for mobile money, following interventions by both the Post and Telecommunications Regulator of Zimbabwe (POTRAZ) and the Reserve Bank of Zimbabwe (RBZ). In 2013 for example, the RBZ issued guidance to MNOs to enhance interoperability with banking platforms and a directive for tariffs to be lowered (RBZ, 2013). These measures were recommended with a view to enhancing the progress with regards to financial inclusion and a shift to an economy less dependent on cash-based transactions. In this same period, perhaps linked to this development, Econet reduced their tariffs by up to 34% and set tariffs for transfers of less than USD1.00 to zero (Econet, 2013). At the time, Econet announced that their EcoCash platform was up to 50% cheaper than the cheapest alternative; and cheaper by a larger margin than bank and non-bank offerings for local transfers, such as through ATMs, credit and debit cards, Western Money Union and Moneygram (Econet, 2013). According

2 Using tariffs effective 1 May 2014. Tariffs available on the Equity Bank company website.

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to the Econet website:

> Econet even compared its service with those of Western Money Union and Moneygram, which are by far the most expensive. For example, sending $150 locally would cost $5 with Western Union against only $2.45 with EcoCash. For most other options available the charges include a minimum fee plus a percentage of the amount to be sent which makes it expensive for the lower band transactions and complex for the customers. For example, if one is to send $5 using EcoCash they are charged only 9 cents while TextaCash charges 25 cents and other banks charge as high as a dollar. For sending $500, EcoCash charges $4.49 while TextaCash charges $5.20 and some banks will charge as high as $6. (Econet, 2013)

Data were not available to verify the assertion, however, it is expected that mobile money platforms have, over time, presented a significantly cheaper and more accessible money transfer mechanism to the benefit of consumers in Zimbabwe (FinMark Trust, 2015). Importantly, for the assessment of competitive dynamics in this market, we do not expect that EcoCash could decrease tariffs significantly over time, if it was not profitable for them to do. This suggests that margins on mobile money tariffs are sufficient to sustain a decrease in price and tariffs are likely to have been above a competitive level before a reduction. However, absent detailed price and cost data, it is difficult to draw strong conclusions, noting the high likelihood of cross-subsidisation across services by MNOs, required returns on investments made and common costs.

Tanzania

The analysis of prices across the markets, in the sections to follow, shows that prices for transactions across various transaction values in Tanzania are well below those in both Kenya and Zimbabwe (as will be shown in Figure 12). The growth of mobile money is also reflected in the Bank of Tanzania statistics on various payment systems, whereby in 2010 and 2011 the volume of transactions made, using mobile payments, began to exceed significantly those made using Internet banking and mobile (SMS) banking and other forms of payment mechanisms.[3] While this is not reflective of the value of transactions made, for which mobile payment values tend to be lower than traditional banking mechanisms, it does suggest that mobile payments are filling a clear gap in consumer demand and thus enhancing consumer welfare, whether due to price or non-price factors.

Based on the available data on mobile payments tariffs, the charge to a consumer for transferring the equivalent of USD10 to a registered user on M-Pesa would be USD0.15 (based on M-Pesa tariffs in 2015), and USD0.17 for transferring USD20, which is nearer to the average transaction value of USD20 (CGAP, 2014). The latter

3 Bank of Tanzania website.

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is lower than the fee charged in Kenya for the same transaction (CGAP, 2014). Tariffs charged for higher value transactions of TZS50,000 (about USD25) in Tanzania, on Airtel and Vodacom, were up to five times lower than those available for an EFT across Tanzanian banks (Nethope & MEDA, 2013). Similarly, 51% of households (in a sample of 828 households surveyed) used mobile money for delivery of remittances (any provider) at an inclusive cost (median) of TZS1500 (about USD0.96 at the time of the study) to send a median amount of TZS38 375 (InterMedia, 2013). For a direct deposit with a bank (only used by 2% of households in the survey), the median amount sent or received was TZS240,000 (about USD153 at the time of the study) at a cost of TZS3,625 (around USD2.31). Other things being equal, the median cost for mobile money transactions in the study were lower than those for a range of other transaction mechanisms, including bank deposits.

Non-price benefits to consumers are far-reaching as well. For instance, households with at least one mobile money user are more likely to make use of adjacent financial services, such as savings and insurance products and, overall, are four times more likely to send or receive remittances in a period of six months (InterMedia, 2013). Consumers also benefit from access to a wide agent network (larger than in Kenya) of 166,000 agents, of which 52% serve multiple operators (CGAP, 2014).

4. Competition issues in network industries: The case of mobile payments

Mobile money markets exhibit both direct and indirect network effects. A mobile money product becomes more attractive to customers, as more people join the network and it also becomes more attractive to agents, as more customers join and vice versa. Network effects tend to increase barriers to entry, as larger networks are more attractive to consumers and small entrants can struggle to attract customers. They may also cause markets to tend towards "tipping points", where one technology becomes the dominant standard (Anderson, 2010). Such outcomes can still be efficient where *ex ante* competition "for the market" ensures that *ex post* rents are passed through to pivotal buyers, although there may be distributional concerns as locked-in buyers are forced to pay more (Farrell & Klemperer, 2007). However, such models tend to be overly simplistic and, in reality, there are a number of ways in which incompatibility harms consumers and reduces efficiency (Farrell & Klemperer, 2007).

A market is likely to be served by a single platform when multi-homing costs are high for users; where network effects are positive and strong; and where users do not have a strong preference for special features (Anderson, 2010). Mobile banking in developing markets has the potential to tip towards a dominant platform, especially in situations where a proprietary platform is launched by an established MNO that already has a dominant market position (Anderson, 2010). This may be of concern, since network effects also tend to increase the opportunity and incentive for strategic behaviour by incumbent firms, as entry is already difficult and the benefits to

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achieving dominance are particularly large (Farrell & Klemperer, 2007).

The emergence of a dominant player in the mobile payments market can result in a lack of competition (CGAP, 2012); while dominance in the mobile payments market and the market for traditional MNO services, simultaneously, can be mutually reinforcing, due to the network effects in both markets. Indeed, it is possible that an MNO that is dominant in both markets may seek to leverage its market power in the mobile services market, into the mobile payments market, as a means of protecting rents in the mobile services market. Mobile payments have proved extremely popular in all three of the countries we have studied. The MNOs themselves acknowledge the value of mobile money as a means of inducing customer loyalty in the mobile services market.[4] This indicates that part of the value of the mobile money platform is derived from its ability to help the incumbent retain subscribers in the mobile services market and to reduce subscriber switching. Furthermore, to the extent that the incumbent expects a dominant standard to emerge in the mobile payments market, it may have a further incentive to ensure that its platform becomes that standard, in order to protect its position in the mobile services market. To the extent that the conduct raises barriers to entry and expansion in both markets, which are reinforced by the pre-existing network effects, this conduct could result in harm to competition and hence to consumers.

Bearing this out to some extent, recently a range of competition concerns have emerged in mobile payments markets, mostly relating to the behaviour of large incumbent MNOs. Three of the major issues that have been raised are discussed below.

Issue 1: Interoperability

A key question in network markets is whether compatibility or interoperability between platforms is desirable and whether this is likely to develop naturally, through agreements between firms in the industry, or whether a regulatory intervention will be required. Katz and Shapiro (1985) consider the impact of compatibility on competition. They find that compatibility relaxes competition early in the product lifecycle, since the likelihood of the market tipping towards one product is reduced, meaning that firms have less to gain from competing hard. However, it also tends to intensify competition later in the lifecycle, as one firm is not able to gain control of the market.

A firm benefits from interoperability, or compatibility in the terminology used by the author, if the marginal externality (i.e., the marginal network effect) is strong; if the firm is to join a large network; and if competition is not increased to a significant

4 Econet's 2014 Annual Report for example describes Ecocash as "a key value driver, subscriber retention and loyalty product".

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degree as a result (Economides, 1996). The inherent network effects in the market mean that, as a given network grows (for example through interoperability), it becomes more attractive to members, meaning that their willingness to pay increases and the market price can increase (Economides, 1996). However, interoperability may also increase the level of competition faced by a firm, as it weakens the loyalty effect of having a proprietary network and takes away its competitive advantage in terms of network size. Where the network externality is strong enough, the network effect can outweigh the competition effect (Economides, 1996).

Given this trade off, it is clear that the incentive to allow interoperability with competing platforms will not be uniform across firms. In terms of the three criteria given above, a large firm with more customers will have less to gain and more to lose from pursuing interoperability. The bigger the size disparity between firms, the less likely the large firm is to have an incentive to agree to interoperability. This is confirmed by Farrell and Klemperer (2006) who describe the process of "levelling", where interoperability neutralises the competition advantage of the firm with more customers. Thus "a firm with a big locked-in installed base, or a firm that is exogenously expected to be big, is apt to resist compatibility with a smaller but fierce rival" (Farrell & Klemperer, 2006, p. 86).

Katz and Shapiro (1994) agree stating that, since markets with network effects are prone to tipping, there are likely to be strong winners and losers from incompatibility and, if a firm is confident that it will be the "winner", for example, because it is already dominant in the market, then it will tend to oppose compatibility. In addition, if there is a subset of consumers who have a preference for one firm's products and who are unlikely to switch, this represents a major advantage to the firm, even when selling to consumers with no brand preference (Katz & Shapiro, 1994). In such circumstances, the firm with the existing base of customers may prefer incompatibility.

Motta (2004) presents a model based on Cremer et al. (2000), which analyses the incentives for interoperability of two firms with asymmetric networks. In addition to the insight that an incumbent with a larger installed base may have the incentive to resist interoperability, the model illustrates that, where its installed base is small relative to the number of potential new customers in the market, it is more likely to gain from interoperability. Thus, it is also important to consider the size of the incumbent's network relative to the total potential market. With a simple adjustment to this model, we can vary the assumption of asymmetric networks and assume instead that firms have networks of the same size. Under this assumption, the model shows that both firms would always prefer to have interoperability (see Appendix for further discussion of this model). This suggests that in contrast to the situation of asymmetric networks, where firms have similar-sized networks, interoperability is more likely to be implemented voluntarily by firms.
In terms of mobile money, interconnection increases the number of potential

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transaction partners for customers, which should make using mobile money more attractive and lead to a higher number of transactions taking place. However, we know from the theoretical discussion above that there is another effect to take into consideration, namely the impact of compatibility on competition. The discussion above suggests that, where there is one large firm, which already has a dominant position in the market and therefore a high probability of "winning" the market for itself, it may well not have an incentive to interoperate despite the positive network effects. On the other hand, if there are two or more networks of similar size, then mobile payments providers may be more likely to voluntarily enter into interoperability agreements.

CGAP (2011) suggests three categories of possible interoperability, namely platform, agent and customer interoperability. Platform interoperability suggests that customers can send money from their mobile money account on one network to a mobile money account on a different network. Agent interoperability implies the ability for agents to serve more than one network.[5] Finally, customer interoperability means that customers are able to access their mobile money account through any SIM. The most common category in our three focus countries is agent interoperability although, as discussed below, concerns have been raised in some jurisdictions around agent exclusivity and the impact this has on competition. Customer interoperability is currently not available anywhere, however, platform interoperability has been implemented to a limited extent in both Tanzania and Zimbabwe. In Zimbabwe, the smaller mobile payments providers have agreed to link their platforms together and use the national payment-switching platform ZimSwitch, without the participation of the largest player. In Tanzania, the four main mobile money providers have developed and agreed to common operating standards, to enable them to facilitate cross-platform transactions, although there is currently no regulatory mandate to force the firms to implement the standards and it is a purely voluntary agreement (CGAP, 2015).

An even more limited form of interoperability, where money can be sent by SMS to an unregistered recipient, is available in all three countries, but recipients are forced to cash out the received funds, incurring transaction costs, which are charged to the sender. A means of further limiting the attractiveness of this option is to charge higher fees for transactions to unregistered recipients, over and above the cash-out fee being charged to the sender up front. This practice has been raised as a competition concern by some competitors. For example, Airtel, one of Safaricom's competitors, has complained to the Competition Authority of Kenya about

5 It is important to note that agent interoperability can go further than this, to a model where customers of any network can cash in or cash out at any agent, including agents of rival MNOs.

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the differential tariffs Safaricom charges for money transfers to other networks.[6] Similarly, in Zimbabwe, the incumbent provider Econet charges significantly higher rates for transfers to unregistered recipients. Such differential tariffs tend to exacerbate the network effects inherent in the market, as they make it more expensive to send money to any other network. We discuss this issue further in Section 5.

Issue 2: Agent exclusivity

Competition concerns have also been raised regarding the requirement, by some operators, that the agents who provide the cash-in/cash-out facility to their customers only serve one mobile payments provider. For example, competing operators complained to the Competition Authority of Kenya about the fact that Safaricom required its agents to operate exclusively for M-Pesa and did not allow them to also deal with other networks (Heuler, 2014). This strategy could be anti-competitive if pursued by a dominant incumbent with the aim of preventing smaller rivals from growing in the market. Exclusive dealing can be anti-competitive if it forecloses competitors from a substantial portion of the market and where there are scale economies, particularly if the exclusive agreements are of long duration or indefinite (Motta, 2004). In two-sided markets with network effects, it is possible for a dominant incumbent to sign up one side of the market exclusively and extract the full network benefits from the other side, resulting in the anti-competitive foreclosure of entrants (Dogonoglu & Wright, 2010).

It is easy to see how this strategy could be used by a dominant incumbent in a mobile payments market. By tying up many agents in exclusive arrangements, it can ensure that customers have little choice, but to use its platform. Furthermore, the direct and indirect network effects present in the market mean that it may not even be necessary to compensate agents for agreeing to exclusivity, since, by virtue of its much larger installed base, the incumbent's product is already much more attractive than that of the entrant. If the agent is forced to choose between selling the incumbent's product and that of another provider, it is likely to choose the incumbent's product as it will make many more sales. Finally, the more agents sign up to sell the incumbent's product, the more customers are dis-incentivised to switch networks. Thus, unless agents can coordinate their decisions, which is unlikely as they are many and dispersed, they are likely to all individually choose to sell the incumbent's product.[7]

In Kenya, competitors argued that Safaricom's policy made it difficult for them to

6 We note that Airtel used a similar tariff structure initially, but later switched to a zero fee structure for the money sending component to all networks (withdrawing cash still attracted a charge). However, the concern around asymmetric pricing within versus across networks arises when this is practiced by a dominant firm with a large existing base of customers, in a market where network effects are important.

7 This logic is similar to the theory of "naked exclusion" discussed by Rasmusen et al. (1991) and Segal and Whinston (2000).

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compete with Safaricom, which, due to its first-mover advantage, had a far greater number of agents in Kenya than any of its rival operators and, arguably, had already tied up the most attractive agents in exclusive arrangements. On the other hand, Safaricom argued that it had invested heavily in setting up the agent network, in terms of finding and training the agents, who had not previously had any experience of the concept of mobile payments. It argued that it was therefore entitled to protect this investment through exclusivity.

From an economic perspective, there is some merit in Safaricom's claim that opening up the network would enable newer entrants to free ride on its investment in the agent network. However, there is a balance to be struck between allowing the incumbent to achieve a return on its investment and allowing it to enjoy supernormal profits indefinitely. Eventually, after the matter was investigated by the Competition Authority of Kenya, in mid-2014 Safaricom decided to open up its agent network to competing providers. Research by the Helix Institute of Digital Finance (2013) indicates that this may be a positive development for mobile money agents in Kenya as well as for consumers. The study involved a survey of agents in Tanzania, Kenya and Uganda; and revealed that agent profitability and support was higher in Tanzania than in the other two countries, due to greater competition and much lower levels of agent exclusivity.

Issue 3: USSD as an essential facility/margin squeeze

The final concern raised in relation to mobile payments is the ability of non-MNO competitors to access their USSD facilities on fair terms. Access to USSD services, which are operated by MNOs, is critical to the provision of mobile payments services. In MNO-led models, MNOs own the key infrastructure involved in providing these services, but they also compete with other providers of mobile payments, such as banks. Importantly, while individual MNOs may have their own infrastructure, banks and other providers leverage the infrastructure of the same MNOs to compete with them. This increases the likelihood that access to infrastructure that is not offered on fair and reasonable terms can place a constraint on the ability of rival providers, particularly non-MNO operators, to compete effectively. This may have to do with the wholesale price at which access to the USSD services or platform is granted, particularly where the price charged is high relative to the costs of providing the service and relative to the price which the MNO that owns the infrastructure applies in the determination of its own price (Hanouch & Chen, 2015). In some cases, it may be that the costs of providing services to other users is higher, due in part to technical considerations and the costs of acquiring and maintaining additional infrastructure such as servers. However, dominant MNOs may also have the incentive to exclude competitors, by decreasing the quality of access to infrastructure and USSD services, or charging a very high price.

These aspects formed part of a complaint raised with the competition authority by

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banks in Zimbabwe. Econet had initially refused to allow banks access to its Ecocash platform making it impossible for bank customers using Econet to pull money from their bank account to send via Ecocash. Econet subsequently granted access to banks, however, applying conditions of access that were considered unfavourable by the banks. In 2014, the Bankers' Association of Zimbabwe (BAZ) complained on behalf of its members about the conditions of access granted by Econet, which included a USD0.30 charge per session for person-to-person transactions, whereas the charges for access for other mobile banking transactions was USD0.05, or zero, in some cases. They also argued that, in order to make a payment, customers were required to access a secondary USSD code separate from that used for other mobile banking transactions, which inconvenienced bank customers and implied an additional charge. Finally, the session times available to bank customers would be limited to 20 seconds, whereas those which Econet set for their own clients were wider at 40 seconds. The higher charge in this case could effectively be classified as a margin squeeze, or constructive refusal to supply. As in the case of Safaricom, the operator argued that the additional charge was justified by the costs of servicing additional bank clients.

In 2014, the Kenyan competition authority announced a market inquiry into the provision of USSD services covering prices, other conditions of access and consumer protection concerns. The inquiry has as its objectives "to assess whether the provision and pricing of USSD services leads to constrained competition in the financial services market" (FSD Kenya, 2014). While the findings of the enquiry had not been released as at November 2016, it is clear that the concerns identified in Zimbabwe, regarding the price and conditions of access, are common in markets where rivals of MNOs rely on the key infrastructure owned and operated by those MNOs, who can face incentives to raise rivals' costs. However, as noted above, it is important to consider the costs and investments involved in providing access to these users and the investment justifications of MNOs in charging rates that reflect these.

5. Outcomes for consumers: Interoperability and transaction fees in Kenya, Zimbabwe and Tanzania

In order to understand the importance of market structure and competition dynamics on outcomes for consumers, we have conducted an analysis of the likely incentives for interoperability and outcomes, in terms of transaction fees in the three countries. We consider each country in turn and then draw some overall conclusions.

Kenya

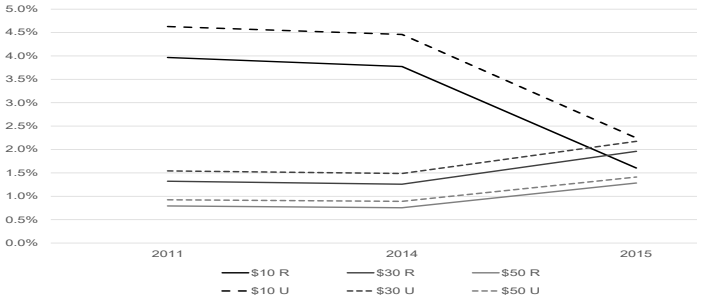
Following from the theoretical review above, we would expect that Safaricom, as by far the biggest player in both markets, might have little to gain and a lot to lose by allowing smaller competitors to interoperate with M-Pesa. It already has 17.1 million out of 26.3 million mobile money subscribers and accounts for 84% of transaction value (CAK, 2016) and, as such, the marginal network externality of growing its subscriber base further is likely to be much lower than that of Airtel and the other

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competitors. On the other hand, the M-Pesa network is more than four times the size of its nearest rival in subscriber terms (Airtel) and more than five times the size of its nearest rival in terms of transaction value (Equitel/Finserve) (Communications Authority of Kenya, 2016). Safaricom is therefore likely to be significantly more attractive to customers than its rivals. It is likely to already expect to be the "winner" in this market, reducing its incentive to allow platform or customer interoperability with rivals. Rather than opening up its network to competitors, it may have an incentive to maintain its dominance, particularly given the knock-on benefits in terms of inducing customer loyalty in its core market for MNO services. Based on the number of mobile phone subscribers in Kenya, there are 13.5 million potential new customers in the market, compared to M-Pesa's installed base of 17.1 million, which further suggests that interoperability is unlikely to be in its interest based on the model discussed above.[8]

Figure 7 analyses M-Pesa's pricing in 2011, 2014 and 2015 at three different transaction levels.[9] It illustrates that prices for the lowest (and most common) transaction values were much higher as a proportion of transaction value than they were for higher value transactions until 2015, when the cost of sending USD10 was substantially reduced. In 2011, prices varied between 0.5% and 4.5% for the three transaction values, but, by 2015, the range had narrowed to between 1% and 2.5% of transaction value. The change in pricing structure in late 2014 may have been in response to an increase in competitive activity in the sector, with the launch of new MVNOs with mobile money offerings, such as Tangaza, and a partnership announced between Airtel and Equity Bank (Nleya & Robb, 2014).

Figure 7: M-Pesa charge to registered and unregistered recipients as % of transaction value for USD10, USD30 and USD50 transactions



Source: Authors' calculations based on Michaels (2011), Safaricom website
Note: *all transaction values have been deflated such that the charges are comparable across years.*

8 There are, however, recent efforts to coordinate the various MNOs towards interoperability through the Mobile Money Association of Kenya, although this is a very recent development, as of November 2016 and it is too early to evaluate its possible effect.

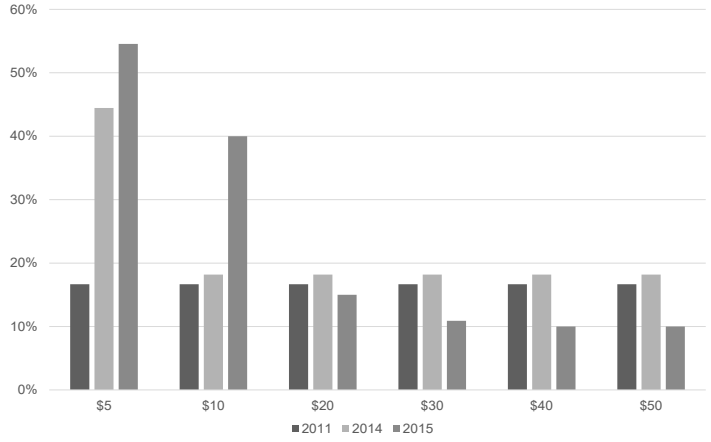
9 In early 2015, the average mobile payment transaction size in Kenya was around KES2580 or USD28 (Reserve Bank of Kenya, 2015), but the median transaction value is likely to be substantially lower.

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Another interesting point that emerges from the pricing analysis is that M-Pesa charges significantly more to send money to unregistered than to registered users. Figure 8 illustrates that in 2014, M-Pesa charged between 10% and 55% more to send money to an unregistered user. Thus, although it is technically feasible to send money to a recipient on a different mobile network, M-Pesa's pricing makes it unattractive to do so. This was the subject of a complaint by Airtel to the Competition Authority of Kenya, as discussed above.

Another interesting development is that, with the recent reduction in prices at low transaction values, the price differential between transactions to registered and unregistered recipients has grown substantially. This makes sense in terms of the theory discussed above. As Safaricom has reduced its prices in response to competition from new entrants, it has simultaneously increased the charge to send money to unregistered recipients, which tends to reinforce its network effects advantage and discourage the use of new, smaller networks.

Figure 8: Difference (%) between M-Pesa charges to registered and unregistered recipients



Source: Authors' calculations based on Michaels (2011), Safaricom website
Note: all transaction values have been deflated such that the charges are comparable across years.

Zimbabwe

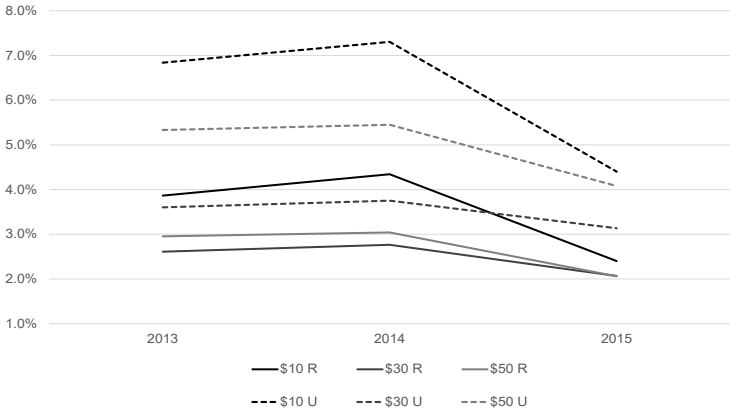
In the case of Zimbabwe, even more than in the Kenyan market, one would expect Econet to have little incentive to agree to interoperability. On the other hand, there are a large number of potential new customers in Zimbabwe as, in 2014, there were 13.9 million mobile subscribers and only 3.7 million mobile money subscribers, a difference of 10.2 million. According to the theory discussed above, this should make it more likely that Ecocash would benefit from interoperability. However, in practice, although NetOne and Telecel have integrated their mobile payments platforms through the national payments switch, ZimSwitch, Econet will not agree to link

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its Ecocash platform into the system, preferring to maintain a proprietary system. One possible reason for this is that only 6.7 million people in Zimbabwe know about mobile money, and of these only 45% are registered (Finscope, 2014). The majority of those who know of it, but do not use it, state that this is because they either do not have money to send, or do not have a cellphone. Thus, in reality, the potential market is likely to be significantly less than 6.7 million people.

Turning to an analysis of Ecocash's prices, Figure 9 illustrates that prices stayed largely the same from 2013 to 2015. The appearance of a price fall in 2015 is a result of changing transaction bands, due to deflating the transaction amounts being tracked. Also, the lowest transaction value is the most expensive as a proportion of transaction value. Prices as a proportion of transaction value are high at between 2% and 8% of transaction value.

Figure 9: Ecocash charge to registered and unregistered recipients as a percentage of transaction value for USD10, USD30 and USD50 transactions[10]



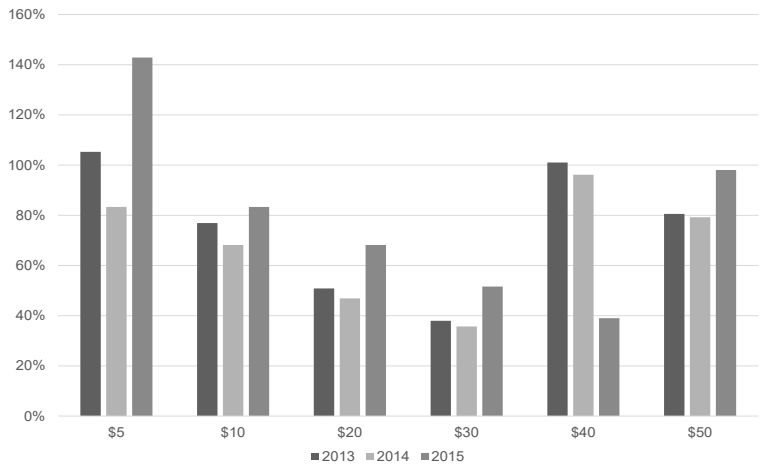
Source: Authors' calculations based on Econet website
Note: all transaction values have been deflated such that the charges are comparable across years.

Figure 10 illustrates that there is an even bigger difference between charges to registered and unregistered recipients than that charged by M-Pesa in Kenya at between 40% and 140%. Again, the greatest difference is at the most common low transaction values.

10 In 2014, the average mobile payment transaction size in Zimbabwe was USD18 (Reserve Bank of Zimbabwe, 2014) but the median transaction size is likely to be much lower.

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Figure 10: Difference (%) between charge to registered and unregistered recipients



Source: Authors' calculations based on Econet website
Note: all transaction values have been deflated such that the charges are comparable across years.

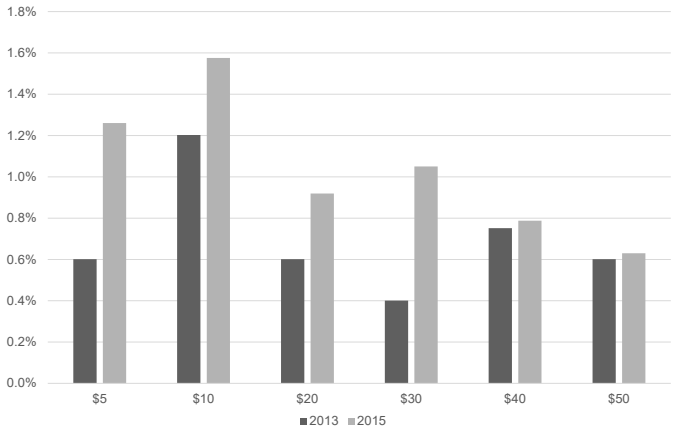
Tanzania

The greater symmetry between players appears to have had a positive impact on competition in Tanzania, with Vodacom, Tigo, Airtel and Zantel all signing up, in late 2014, to a set of voluntary standards, which will govern how cross-platform payments work (CGAP, 2015). Tigo, Airtel and Zantel had previously announced an agreement to allow interoperability in their mobile money platforms by mid-2014, which would have created a network of similar size to Vodacom's M-Pesa. This may have made it more attractive to Vodacom to join the initiative than to keep its platform separate. Initial indications from Tigo suggest that they believe that opening up to interoperability has been a good decision (CGAP, 2015).

An analysis of Vodacom's pricing suggests that its prices are lower, as a proportion of transaction value, than Safaricom's, or Econet's, which may be indicative of greater competition. Figure 11 illustrates that prices range between 0.4% and 1.6% of transaction value and increased at most levels between 2013 and 2015, such that prices as a proportion of transaction value are highest at the low end. What is striking about an analysis of Vodacom's prices in Tanzania, however, is that there is no difference in the prices charged to registered and unregistered recipients. This may also reflect greater competition in both the mobile money market and the broader MNO market and therefore the much greater likelihood that a given recipient will be a customer of another network.

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Figure 11: Vodacom charge as a percentage of transaction value for USD5, USD10, USD20, USD30, USD40 and USD50 transactions[11]



Source: NetHope and MEDA (2013), Vodacom website
Note: all transaction values have been deflated such that the charges are comparable across years.

A study carried out by the Helix Institute of Digital Finance (2013) suggests that in urban areas, the mobile money market may be even more competitive than the market shares suggest. The study found that only about half of agents in Tanzania are exclusive and the figure is less than 20% in Dar es Salaam, where market shares in terms of agents are relatively more equal between the three main players (41%, 17%, 37%). They found that agent exclusivity was much more common outside Dar es Salaam and in rural areas, where Vodacom has a higher market share in terms of agents (Helix Institute of Digital Finance, 2013). This may explain the more competitive outcomes that are observed in terms of pricing and interoperability in Tanzania.

6. Comparison of the three countries

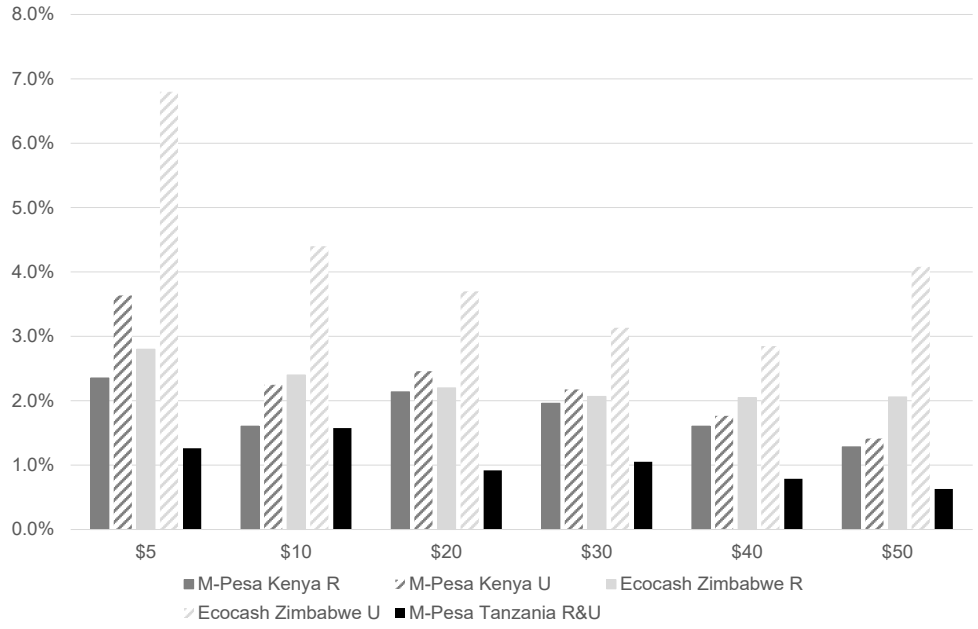
A comparison of Kenya, Zimbabwe and Tanzania has suggested a number of interesting differences in the structure and dynamics of their mobile payments markets, which tend to reflect the economic theory of network industries and which suggest certain policy implications. The pricing analysis of the largest mobile money provider in each country shows that the most expensive is Zimbabwe's Ecocash and the cheapest is Tanzania's M-Pesa, with Kenya's M-Pesa falling in the middle. This reflects precisely the degree of competition in the three countries, with Tanzania's mobile money and MNO markets being the least concentrated and Zimbabwe's

11 The average mobile payment transaction size in Tanzania in 2014 was USD29 (CGAP, 2014), but the median transaction is likely to be lower. The median transaction size (sent or received) found in a survey of households in Tanzania was approximately USD24.50 (InterMedia, 2013).

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being the most. Similarly, Ecocash charges significantly more to transfer money to unregistered recipients, compared to registered recipients, with Kenya's M-Pesa charging slightly more. Tanzania's M-Pesa, on the other hand, charges the same transfer fee to registered and unregistered recipients.

Figure 12: Cross-country comparison of charges as a percentage of transaction value for USD5, USD10, USD20, USD30, USD40 and USD50 transactions[12]



Source: See Figures 3, 7, 11

In general, the predictions of economic theory, relating to network effects and compatibility, appears to be borne out in the three examples we have studied. Interoperability seems to be more likely to be in the interest of firms where markets are more symmetrical and there is not one super-dominant player with a great deal to lose from opening up the market. Interestingly, even though there are a substantial number of potential new customers in Zimbabwe, the fact that Ecocash is a near monopoly seems to have reduced its incentive to agree to interoperability. It may be that its expectation of "winning" the market is strong enough to make it certain of winning most, if not all, new customers.

Of concern to policymakers in Zimbabwe and Kenya is the fact that the incumbent

12 The average mobile payment transaction sizes in Kenya (2015), Zimbabwe (2014) and Tanzania (2014) respectively in 2014 were USD28, USD18 and USD29 (CGAP, 2014), but the median transaction is likely to be much lower.

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in both markets is in a very strong position, which, far from being eroded by competition, appears to have strengthened over the past three or four years. Both theory and practice seem to suggest that, in these markets, interoperability is unlikely to develop naturally and some form of intervention may be required, in order to ensure that there is a level playing field for competition. This is particularly important given the fact that incumbents in markets with network effects are more likely to have the ability and incentive to engage in anti-competitive conduct, in order to protect their profitable position in the market. They are also more likely to engage in market strategies that leverage the strong position in adjacent and growing markets, to strengthen their position in the primary markets, such as those for traditional MNO services. Recent competition cases in Zimbabwe and Kenya bear this out. In Tanzania on the other hand, full interoperability between the different platforms is already on the way to developing naturally, by agreement between the different players. Regulators would still be well advised to monitor the development of the market, but there is likely to be less need for active intervention.

7. Concluding remarks

This article has attempted to highlight the benefits and some of the potential problems in developing mobile payments markets. Available information on the relative tariffs of traditional banking services versus mobile money suggest that mobile payments are a significantly cheaper method of sending and receiving money. However, it is also clear that non-price factors in favour of mobile payments as a mode of transacting, such as convenience, accessibility, safety and reliability, are just as important, if not more so. Rivalry between operators, in this regard, can take place through tariffs charged, but also through the size and footprint of the operator's agent network and the range and quality of services offered. In each of these areas, various competition complaints have been raised in the three countries studied, including on agent exclusivity, prices and access charges.

Experience in Kenya, Zimbabwe and Tanzania has illustrated the challenge of encouraging competitive rivalry in network markets where one firm has a dominant, or even super-dominant, position and, therefore, has little incentive to open up its network to smaller competitors. The emerging experience of countries with such a market structure suggests that there may also be an incentive for firms to use their dominant position in the market, to pursue strategies to exclude and marginalise competitors. This is particularly problematic in mobile payments markets, where network effects and a dominant position in the market for traditional MNO services can easily be translated into a virtually unassailable position in the market for mobile payments. This, in turn, can be used to protect the incumbent's position in the market for mobile services. The pricing analysis shows that, where there is a dominant incumbent, tariffs for mobile payments tend to be higher and reflect a wider gap between those for registered and unregistered customers, which has the effect of strengthening the incentives of existing customers to remain on the network

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(including for traditional MNO services) and attracting new ones. While this pattern is beneficial for customers, the likely long-term consequences can be that the market tips towards the dominant player, denying rivals scale and reducing the incentives of the incumbent to innovate further and maintain competitive prices relative to rivals.

Whilst investments made by the dominant incumbent in its network must be acknowledged and it must be allowed to make a reasonable return on such investments, there is a risk that, if left to themselves, such markets will tip towards sub-optimal equilibria. In the long term, the ability of new players to come into the mobile payments space and compete effectively for customers is important to ensure continued innovation, quality and low prices and, therefore, to preserve and extend the dynamic benefits to customers that have been discussed above. This will also have knock-on benefits, in terms of reducing barriers to entry and in terms of consumer switching in the market for mobile services. The results of the market structure and pricing analysis conducted in this study suggest that, in markets dominated by one large player, regulators may need to consider interventions to prevent the exclusion of competitors and to ensure the development of interoperability at all three levels, namely agent, platform and customer. This will be important in terms of levelling the playing field for competition.

Arising from the experiences of the three countries, a number of lessons can be drawn for regulators. Firstly, in Zimbabwe, a collaborative and adaptive approach by all three relevant regulators (the RBZ, POTRAZ and the Zimbabwean Competition and Tariff Commission (ZCTC)) has allowed for a timely response to competition concerns that have arisen. This process has also been undertaken in consultation with the relevant stakeholders, just as in Kenya, where the regulatory approach has also been iterative and inclusive. This approach is appropriate in an environment where the potential for competition concerns is high, particularly where there is a large dominant operator with limited incentives to interoperate. Secondly, it is important to balance the need for interventions to promote competition with the need to maintain incentives for investment by operators. The discussion above points to the fact that some large operators have invested substantially over time in improving the offering to customers and pursuing interoperability at an early stage in the development of the market may be counter-productive in terms of the growth of the market overall. In addition, in a more competitive market such as Tanzania, interoperability may develop between operators with strong encouragement by the regulators, although there may be some way to go in this regard. Importantly, the experiences highlighted above suggest that there is no one-size-fits-all solution for the regulation of mobile money markets, although it is clear that regulators should closely monitor the market as it develops and respond adaptively to competition concerns as they arise.

The issue of competitive dynamics in mobile payments markets and the implications for consumer outcomes is a relatively unstudied area, probably due to the novelty of

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these markets and the scarcity of data pertaining to them. However, it is a highly topical area of interest for a number of countries, including the three we have discussed in this article, who are currently grappling with the appropriate regulatory approach to mobile payments markets, in order to promote competition, without dampening incentives for investment and innovation. This article has attempted to contribute to filling this gap by drawing together economic theory and available data on three countries. However, it has been limited by data availability. Further work in this area could seek to analyse more countries and consider in greater depth the developing dynamic rivalry between mobile payments and traditional modes of sending and receiving money, including the growing participation of banks as providers of overlapping services, particularly where detailed price data for the banking sector is available.

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Appendix 1: Modelling the incentives for compatibility in industries with network effects

As noted above, the model presented below is the same as that discussed by Motta (2004: 485 – 490) which is in turn based on that of Cremer, Rey and Tirole (2000). We first present the model as discussed by Motta (2004) and then use the model to illustrate one additional result.

In a market with network effects there are two firms, Firm 1 and Firm 2 who each already have an installed base of customers: β_1 and β_2. Customers attach an intrinsic value T to the network. Therefore to the consumer, the net benefit from network product i is:

$$S_i = T + s_i \quad p_i \qquad (1)$$

where p_i is network i's price, and s_i is the benefit to the customer from the network effect, given by:

$$s_i = v[\beta_i + q_i + \theta(\beta_j + q_j)] \qquad (2)$$

where q_i and q_j represent the number of new consumers buying from firm i and j, $v < \frac{1}{2}$ is a parameter (common to all consumers) that indicates the importance of the network externalities and $\theta \epsilon [0,1]$ is a parameter that indicates the quality of interoperability between the two networks. If $\theta = 0$, there is no interoperability and if $\theta = 1$, there is full interoperability. Motta (2004) shows that in this situation, firm i's demand function takes the form:

$$p_i = 1 + v(\beta_i + \theta\beta_j) \quad (1 \quad v)q_i \quad (1 \quad v\theta)q_j \qquad (3)$$

Assuming that each firm chooses output to maximise its profits, Motta (2004) shows that finding the intersection of the firms' best reply functions gives the equilibrium of the game:

$$q_i = \frac{1}{2}\left(\frac{2(1-c)+v(1+\theta)(\beta_i+\beta_j)}{2(1-v)+(1-v\theta)} + \frac{(1-\theta)v(\beta_i-\beta_j)}{1(1-v)-(1-v\theta)}\right) \qquad (4)$$

Motta then sets β_2=0 (so that the entrant has zero installed base) and $c = 0$ (to simplify the example) and considers whether Firm 1 and Firm 2 will be better off where $\theta = 1$ or $\theta = 0$. He finds that Firm 1 will prefer full interoperability if:

$$q_1(\theta = 1) \quad q_1(\theta = 0) = \frac{v\left(1-2v-\beta_1(3-4v+2v^2)\right)}{3(1-v)(3-8v+4v^2)} > 0 \quad (5)$$

which is true for $\beta_1 < \frac{1-2v}{3-4v+2v^2}$. Thus when the incumbent has a much larger installed base than the entrant, the incumbent will only find it profitable to agree to interoperability if its installed base is small relative to potential (new) demand. On the other hand, if the installed base is large relative to potential demand, interoperability will make the incumbent worse off. The entrant is always made better off by agreeing to interoperability because:

$$q_2(\theta = 1) \quad q_2(\theta = 0) = \frac{v\left(1-2v+\beta_1(6-11v+4v^2)\right)}{3(1-v)(3-2v)(1-2v)} > 0 \qquad (6)$$

In order to look at a further example relevant to our discussion, we set $\beta_1 = \beta_2$ to illustrate the situation when the two firms have the same installed base. Following Motta (2004), we also set $c = 0$. Firm 1 will prefer full interoperability when:

$$q_1(\theta = 1) \quad q_1(\theta = 0) = \frac{2v(1+\beta_1(3-v))}{3(1-v)(3-2v)} > 0 \qquad (5)$$

Expression (5) shows that in this model, where firms have the same size of installed base, they will always prefer full interoperability.

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Competition in Mobile Financial Services: Lessons from Kenya and Tanzania[1]

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Abstract
Mobile financial services (MFS) are the main drivers of financial inclusion in many developing countries, where they provide low-income consumers with access to transfers, payments, and increasingly more complex products including credit, savings, and insurance. MFS channels can provide the advantages of convenient, secure, and cost-efficient product offerings to consumers. In several markets, MFS have helped to significantly increase the portion of the population with access to formal financial services. To promote both quality and diversity in MFS products, and in turn financial inclusion, it is important to ensure a competitive ecosystem that facilitates entry into the market, the development of innovative MFS products, and high-quality, value-for-money services. This article aims to provide insights into the role that effective competition and competition policy play in developing MFS, and in promoting financial inclusion, using Kenya and Tanzania as case countries.

Keywords
mobile financial services, competition, Kenya, Tanzania

Recommended citation
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1 This article is revised for publication from a working paper written for CGAP, https://www.cgap.org/sites/default/files/Working-Paper-Competition-in-MFS-Kenya-Tanzania-Jan-2016.pdf

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1. Introduction

In this discussion, mobile financial services (MFS) refers to mobile money and digital platform accounts services that are primarily accessed via mobile channels and agent networks that are serving a significant portion of previously un-served and underserved financial consumers in emerging markets. Mobile money is now available in most developing and emerging markets, with 219 mobile money services in 84 countries at the end of 2013 (Almazán & Sitbon, 2014; GSMA, 2014a). Indeed by the end of 2013, nine markets had more mobile money accounts than bank accounts. This paper uses the experiences of two of the leading MFS markets in the world—Kenya and Tanzania—to identify priority competition issues in MFS for policymakers to consider and, where relevant, act upon.

In the mobile financial services (MFS) market, effective competition can improve financial inclusion in a number of ways:

- *Price:* Effective competition among providers drives them to operate more efficiently and price their products competitively to attract consumers. This can lead to lower costs passed on to consumers and businesses, which can make financial services more affordable to low-income, underserved populations (Balasubramanian & Drake, 2015; Economides & Jeziorski, 2016).
- *Quality of products:* Effective competition incentivises providers (i) to ensure that the products they provide are high quality and (ii) to retain consumers, helping adopters of products remain active users—all the more pertinent given high dormancy rates experienced by some providers of MFS (Di Castri, 2013; Mas, 2014).
- *Variety and diversity of products:* Effective competition also incentivises providers to introduce new and innovative MFS products and services, which promotes increased uptake and use of financial services among the poor (G20, 2016; Hanouch & Chen, 2015).
- *Quality of service:* Where consumers have a wider range of options for products and services, service quality is often promoted, as firms compete on service to mitigate against consumers switching providers. In MFS markets, service can impact product quality in multiple ways, including the quality of the financial product, but also the quality of the telecommunications channels and agent networks through which these services may be accessed (Bourreau & Valletti, 2015; McKee, Kaffenberger & Zimmerman, 2015).

The research methodologies for the MFS study included a review of literature on innovation and expansion of MFS markets and related policies; a review of relevant laws and regulations in Kenya and Tanzania pertaining to the banking and telecommunications sectors; stakeholder interviews and data collection from MFS providers, policymakers, researchers and consumer advocates in Kenya and Tanzania conducted between July and December 2014; and, consumer research with MFS users on digital credit usage and price awareness and sensitivity, in July 2014 and November 2014 respectively.

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2. Key competition issues for mobile financial services in Kenya and Tanzania

Access to the channel for delivering MFS

Access channels are a critical dimension in ensuring a competitive MFS market. Here, we consider the importance of the main channels and their pricing in Kenya and Tanzania, as well as how this can undermine competition. Important implications for regulation are explored. In the market for MFS, financial institutions are customers of, and competitors to, mobile network operators (MNOs). This creates a fundamental conflict of interest, because MNOs control access to the mobile network and have sufficient incentive to restrict access to competitors. There are several potential adverse consequences for competition that may arise from restrictions in channel access (Hanouch & Chen, 2015; Mas & Staley, 2014; Mazer & Rowan, 2015), including potential foreclosure of the market to providers competing in the same space as the MNOs, constituting a barrier to entry; product range in the market may consequently be limited; there is limited scope for innovation by firms with potentially high-value and high-demand products and services, who cannot use prevailing access channels to serve potential customers; high costs may be passed through to consumers in the form of increased prices, due to the cost of channel access.

In Kenya and Tanzania, the dominant front-end technology used in the deployment of mobile banking services is unstructured supplementary service data (USSD) technology. USSD, a communications service controlled by MNOs, is believed to be a critical piece of technology used to provide MFS on nearly any phone, at low cost, and without requiring access to the user's SIM card. USSD enables customers to send instructions to the MFS provider along with their personal identification number (PIN) for authentication, while enabling the MFS provider to send responses to clients and confirm transactions (Hanouch & Chen, 2015).

The price of USSD channel access

The price of USSD channel access is critical in determining how effective competition will be in a market, since it will determine whether, and how easily, providers can enter and compete in the market. In the interviews, a number of stakeholders identified that the cost to MNOs of providing USSD channel access amounted to fractions of one Kenyan shilling (KES). However, Table 1 shows that the prices MNOs charge banks and other third parties are much higher, sometimes considerably higher.

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Table 1: Survey of costs of USSD access paid by MFS providers to MNOs in Kenya (August 2014)

	MNO1		MNO2		MNO3		MNO4	
	Cost (KES)	**Duration (seconds)**	**Cost (KES)**	**Duration (seconds)**	**Cost (KES)**	**Duration (seconds)**	**Cost (KES)**	**Duration (seconds)**
Bank 1	5	180	Monthly access fee		Monthly access fee		Monthly access fee	
Bank 2	4	120	1	180	Not used		No charge	
Bank 3	5	180	No charge		Not used		Not used	
Bank 4	5	180	3	180	Not used		Not used	
Bank 5	5	180	Not used		Not used		Not used	
Bank 6	5	180	Not used		Not used		Not used	
3rd Party 1	5	180	3	180	3	180	2	180
3rd Party 2	10	180						
3rd Party 3 Pre-paid	10	180	3	180	3	180	2	180
3rd Party 3 Post-paid	0.5–1.5	180	3	180	3	180	2	180
Set-Up Costs (where assessed)	100,000		75,000		30,000		50,000	
Monthly Costs (where assessed)	100,000		50,000		10,000		20,000	
KES = Kenyan Shillings. Exchange rate of 101.9 Shillings to the U.S. dollar, as of 2 November 2015.								

Source: Mazer and Rowan data, 2015

Table 1 also highlights how competition issues in USSD access can be magnified where there is an MNO with a very large market share, identified as MNO1 in the table. The presence of a dominant MNO leaves third-party providers with no other option to reach the majority of the market than to go through this MNO, resulting in little incentive for the MNO to drive down the price of USSD sessions. Furthermore, this positions the dominant MNO with considerable power to set prices in the market and control competition by providing or restricting access.

Accessing the USSD channel

To offer USSD access, providers must be licensed to do so by the telecommunications regulatory authority. It is therefore important that an appropriate licensing framework is in place, such that there is fair access to the USSD channel, regardless of firm size, or type, or the content firms offer. When MNOs, which may be direct competitors, in financial services, to the bank or third party requesting USSD codes, are the ones actually issuing the codes, those seeking codes could be at a disadvantage when negotiating with MNOs for the codes on commercial terms, since MNOs have

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significant leverage in negotiating terms for channel access.

Regulatory options for channel access

The extent to which an MFS provider will be affected by the pricing and/or denial of USSD access by an MNO depends, at least in part, on the MNO's telecommunications market share. An MNO with a greater market share will likely be able to charge higher prices, which may have the effect of foreclosure of the USSD access channel. Regulatory intervention is therefore important, where such competition issues related to USSD channel access occur. However, we would caution that regulation should be implemented appropriately, and only after detailed inquiries into the specifics of USSD pricing, quality, and access, as well as broad consultation with all stakeholders who provide and make use of USSD channels. This is an area where coordination among regulators is likely to be necessary, given overlapping jurisdictions and differing preferences in regulatory approach. Mas (2014) asserts that

> banking and telco regulators must work out an integrated regulatory regime for mobile operators that offer mobile money services […] MNOs who are engaged in MFS should be obliged to offer mobile communications services to any other financial institution that requests access, on non-discriminatory and cost-oriented terms. (Mas, 2014, p. 205)

Mas highlights that Peru has spearheaded this approach and that it let the market determine pricing in the first instance. In an alternative approach, India is prescribing a price for USSD (Hanouch & Chen, 2015).

Transparency in MFS products

Price transparency is important in enabling consumers to understand the available products and to make informed choices. This, in turn, is crucial for competitive pressure, as rivals seek to attract consumers with their offerings. It is an important area where regulatory measures can be taken. While traditionally considered an issue relevant to consumer protection and market conduct for financial services globally, lack of pricing transparency can hinder effective competition in at least two important ways (Gabaix & Laibson, 2006; Stango & Zinman, 2011):

- *Increased search costs:* When customers face significant impediments or costs in their search for alternatives, sellers may be able to set prices (or quality of service) with only limited regard to competition.
- *Reduced product comparability:* Where consumers have difficulty accessing information, they may be restricted in their ability to compare the offers available in the market across the various providers.

One or both of these scenarios may result in a lack of competitive pressures on providers to offer value for money and innovative products and services. Transparency is therefore important for ensuring effective competition and financial inclusion. A

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number of transparency-related issues were identified in Kenya and Tanzania, the most pertinent of which are described below.

Transparency of mobile money person-to-person (P2P) payment costs
In both Kenya and Tanzania, there is a degree of price transparency at the point of cashing in and cashing out, as agents display tariff boards. However, disclosure of the cost of P2P payments appears to be less prominent. Many MNOs do not disclose the price of a transfer, either before or after a transaction is completed, either in the USSD session, or in the confirmation SMS messages. This lack of price transparency makes it difficult to compare the total cost of sending and receiving money across MNOs, especially when multi-step transactions are involved, for example, cashing in, sending money, and then cashing out. This makes it difficult for consumers to determine which MFS provider represents best value for money, and exerts lower competitive pressures on providers. Regulators are therefore encouraged to set market-wide transparency rules for MFS.

Transparency of USSD costs on consumer-to-business (C2B) payments
MFS are increasingly used by consumers in Kenya and Tanzania as a convenient and low-cost way to pay for services, such as electricity, water and consumer goods. However, here, too, there is poor transparency of the costing and pricing of payments. This is due to the limited disclosure of (i) the charges paid by the third-party aggregators and by the financial service providers to the MNOs for access to the MNO's USSD infrastructure and (ii) the costs they subsequently pass on to consumers for these C2B payments.

Transparency of terms and conditions—second generation MFS
As MFS markets develop and progress from simple mobile payments towards products like credit, savings and insurance, new issues around transparency will develop. In Kenya and Tanzania, several partnerships between MNOs and financial service providers now offer savings and credit products directly through mobile money services. The nature of these loan products illustrates the transparency issues that can emerge when financial products are delivered via MFS, without considering the implications for proper disclosure of product characteristics, costs, and terms and conditions. For example, upon enrolling for a loan via their MFS provider, many consumers are not informed of the interest rates and rollover charges of the loan, via the mobile interface, before being asked to accept the terms and conditions. Instead, the consumer is often directed to review the terms and conditions on the providers' websites, as is the case for the M-Shwari loan product in Kenya (McCaffrey et al., 2013). Aside from the effort that must be made to view these terms and conditions, this information will not be accessible to consumers without Internet/data access or a smartphone, resulting in many consumers failing to understand the terms of their savings or loan product.

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Transparency and switching behaviour

To promote an effective demand-side, which exerts competitive pressures on providers, there must be the real, or perceived, threat of the consumer switching to another provider. Switching MFS providers may not be technically difficult, given the prevalence of multiple SIMs usage amongst consumers in markets such as Tanzania. However, switching in response to attractive competing offers may be made difficult for customers due to costs of time, price, or ease of switching. Furthermore, in a market without interoperability, consumers may be constrained in their ability to switch to another MFS provider since they will not be able to send or receive money across providers.

Towards a transparent MFS ecosystem

Transparency in MFS can be enhanced by provider improvements of messaging and formats, as well as by improved standards of price disclosure for MFS. For example, in Tanzania, the Electronic and Postal Communications (Consumer Protection) Regulations, 2011[2] state that "A licensee shall not charge consumers for bills or billing related information" (TCRA, 2011a, sect. 9(3)). However, it also lists a number of exceptions, such as where there is a separate agreement (which might include terms and conditions). Exceptions to disclosure of costs, as well as lack of enforcement, can result in insufficient transparency of pricing. In Tanzania, a review of MFS products by the authors revealed inconsistent practices for disclosure of costs to consumers prior to a transaction, with some products such as Tigo Pesa disclosing costs clearly prior to a mobile money person-to-person payment, while M-Pesa did not include such disclosures of cost prior to a mobile money person-to-person payment in user testing by the authors.

Relevant authorities should set market-wide transparency rules, which (i) ensure product terms are fair, clear and not misleading, (ii) increase comparability between products and promote more effective competition. There is already scope for the regulatory authorities in Kenya and Tanzania to enforce existing legislation on this point, hence it is necessary to signal obligations to providers, monitor market practice and address noncompliance. In Kenya, the National Payment System Act (2011) and the Central Bank of Kenya's Prudential Guidelines (2013) put forth standards and obligations for disclosure of costs and terms for traditional financial services and for mobile money. Kenya has also mandated that financial services providers that offer services via digital channels must now present consumers with full information on the costs, before they use the service, on the same screen on which the consumer is transacting (Mazer, 2016). For Tanzania, the Postal Communications (Tariffs) Regulations (TCRA, 2011b, sect. 4(3)) state that charges should be transparent and that tariffs "shall be sufficiently clear as to enable the end-user to determine the description of the service, the details relating to the nature of the service, amounts

2 See also legislation at www.tcra.go.tz/images/documents/regulations/consumerProtection.pdf

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and charges payable for such service." The regulations also state that "a licensee shall provide accurate billing information on tariffs and usage in order for customers to verify whether or not they are billed correctly." Similarly the Electronic and Postal Communications (Consumer Protection) Regulations (TCRA, 2011a, sect. 7(3)) state that "when promoting a product or service, a licensee shall indicate clearly the total charge for the package and terms and conditions that are applicable."

Interoperability of mobile money services

Interoperability can broadly be described as the interconnection of mobile money services either between providers or with external parties. It is well recognised that it reduces network effects, however, it can also reduce the incentives of individual networks to invest in their expansion. In this discussion interoperability refers to the technological interoperability of MFS using common standards and protocols, and not to access to facilities and services, as is sometimes referred to in discussions regarding interconnection. It brings benefits to consumers, mobile money providers and agents through increased convenience, cost savings, a greater choice of providers and better liquidity management for agents. Interoperability is also relevant to some of the most important competition issues in MFS:

- *Reduction in network effects that restrict consumers' freedom to switch:* Without interoperability, it is possible that consumers will remain with an MFS provider they do not prefer, simply because of the size of that network and so are not able to freely choose based on quality of service and price (Bourreau & Valletti, 2015; Di Castri, 2013).
- *Improved user experience and ease of account usage:* Instead of interoperability, some MFS providers offer off-net "voucher" systems, wherein consumers can send off-network, but the recipient must cash out at the sending MFS provider's agents, often at a higher charge than an on-net P2P transaction, and cannot store this value on their mobile wallet. With fully interoperable systems, these types of inferior workaround solutions for across-provider transfers become irrelevant (Benson & Loftesness, 2013; Mas, 2014).
- *Reduction in agent exclusivity:* With interoperability, agents may be more easily able to function as agents for multiple MFS providers, increasing diversity of MFS options for consumers, in particular for rural consumers with limited agent network access (Kumar & Tarazi, 2012).
- *Access to MFS channels by third-parties:* With interoperability, a transaction originating on one MFS network does not prevent landing on another MFS network. This makes it possible for a firm facing high channel access costs from one provider, to use the channel of another provider with more favourable channel access pricing, to originate an MFS transaction and still allow the customer to send the funds to a user of the MFS network that charges the higher channel access costs. This could exert pressure on providers that previously restricted or priced channel access in an anti-competitive manner to reduce their rates.

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Despite the potential benefits to fair competition and increased financial access, full interoperability has not yet come to fruition in most MFS markets. Tanzania, where a multi-firm interoperability agreement was adopted, is a notable exception to this, while Kenya shows no sign of interoperability being achieved soon. This difference is most likely explained by the relative market shares of MFS providers in the two markets, see Table 2 below. As Benson and Loftesness (2013, p. 6) note, "early dominance by one provider can slow or stop interoperability."

Table 2: Selected MFS market shares of MNOs in Kenya and Tanzania (number of subscribers)

	Vodacom	**Airtel**	**Tigo**	**Combination of two or more providers' services**
Tanzania MFS customer market share	53%	13%	18%	16%
	Safaricom	**Airtel**	**Equitel**	**Other providers**
Kenya MFS customer market share	76.8%	11.5%	2.5%	9.2%

Source: GSMA (2014b), Communications Authority of Kenya (2015)

In Kenya, the concentrated market share across MFS providers may create (i) less demand for interoperability from consumers, since most of their peers will use the same provider; and (ii) less willingness on the part of the dominant MNO to extend interoperability, since they may have more to gain by protecting their share of the pie rather than by expanding the size of it. This may explain why, despite articulation of interoperability as a goal for the market in the National Payment System Act of 2011, there has been no noticeable progress towards this goal by the industry. In fact, it is quite reasonable to expect that, with such a dominant MFS provider as Safaricom in Kenya, interoperability would have to be forced on the market by the authorities for it to take effect.

By contrast, the less concentrated mobile money market share in Tanzania, across MFS providers, makes interoperability more appealing for both consumers and providers alike. This difference in market share is likely the primary reason why Airtel, Tigo and Zantel, together accounting for 74% of mobile subscribers and 47% of mobile money subscribers, were able to successfully reach a mobile money interoperability agreement in 2014, and why Vodacom subsequently joined the interoperability agreement in 2015.[3] An important caveat here is that market concentration is significantly higher in rural versus urban Tanzania, as the dominant provider Vodacom's agent network market share is 60% outside of Dar es Salaam, as

3 For a detailed analysis of the interoperability agreement in Tanzania, and the process to achieve this agreement, refer to IFC (2015).

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compared to 41% in Dar es Salaam, where the other two leading MNOs have a more balanced market share (McCaffrey & Schiff, 2014).

While forcing interoperability in the early stages of mobile money market formation may hinder market growth by discouraging first-movers (McKay & Zetterli, 2013), who must invest significantly in building out their product line, marketing, agent networks, platform and other up-front costs, there is a role for regulation, to create an environment that is conducive to interoperability in the long run. This stance is advocated, in particular, by the Centre for Global Development (Bourreau & Valletti, 2015, p. 21): "…*ex ante* regulation should focus on ensuring that firms do not take actions that increase the barriers to achieving interoperability."

From a competition perspective, there are several areas where it may be appropriate and beneficial for policymakers and competition authorities to take steps to facilitate interoperability in the market, notably with respect to restrictions on agent exclusivity, interconnection rates for MFS interoperability, and requiring potential technological interoperability.

Agent exclusivity

Agent exclusivity restrictions allow MFS providers to stipulate that a mobile money agent should remain exclusive to them and not offer competitors' services in their location. Such agreements tend to reinforce network effects,[4] since consumers will wish to use a MFS provider with a large agent network, and these network effects, in turn, reinforce the choice of an agent to remain exclusive to a dominant provider, in order to maintain access to a large number of potential customers. The elimination of agent exclusivity can promote a shift towards interoperability, by reducing these particular network effects and by reducing barriers to entry into the market, and making it easier for consumers in areas with low agent density to choose amongst providers, based on factors besides the presence of agent infrastructure nearby (Mazer, Pillai & Staschen, 2016). With a larger number of non-exclusive agents, the dominance of only one or two firms may be reduced, making technological interoperability more desirable.

In Tanzania, the regulatory authorities mandated non-exclusivity early on, to allow the various MNOs to compete more effectively. Subsequent research found that agents in Tanzania were more likely to be non-exclusive than in Kenya, although non-exclusivity in Tanzania applied to 84% of agents in urban Dar es Salaam, compared

4 The network effect refers to a situation where there is a sufficiently large number of users of a service that consumers choose to use the service, even if they prefer the service of a competitor, because of their need to use the same network as their peers. This effect is particularly significant when there is a large network that is closed off to transactions incoming from or outbound to other similar networks.

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to 38% in rural areas (McCaffrey & Schiff, 2014). In July 2014, the Competition Authority of Kenya mandated the removal of agent exclusivity for all providers, which is considered to have improved the availability of non-exclusive agents, as noted by the reduction in exclusive agents from 96% in 2013 to 87% in 2014 (Khan, Mehrotra, Anthony & Kuijpers, 2014). However, CGAP interviews with agents in Nairobi in 2016 revealed that some agents were being intimidated or coerced to remain exclusive and were being told by representatives of some MFS providers to display their signs more prominently than rival MFS providers at agents' outlets. This highlights the challenge of shifting a market built on exclusivity to nonexclusive arrangements in a short time period, as well as the need for regulatory monitoring and enforcement on competition grounds, where breaches of such regulations are identified.

Interconnection rates and technological interconnectivity

Interconnection rates are important for effective competition for several reasons. First, a high interconnection rate may result in non-interoperability in practice. This would occur if the rates were so much in excess of within-network transactions that it would create a significant enough additional cost to discourage consumers from transacting across networks. For example, the average off-net mobile money transfer charge is around three times higher than on-net in Kenya (Murithi & McCaffrey, 2015). This would result in a reinforcement of the network effect. Furthermore, a high interconnection rate can act as a barrier to entry for MFS providers, since a new entrant will, by definition, have few customers that can be sent mobile money within their network, resulting in expensive transfers for their customers and/or high costs for the MNO, since the MNO initiating the across-network call or transaction has to compensate the receiving MNO under current industry arrangements. A less forceful regulatory approach is to require *potential* technological interconnectivity. This ensures that once providers agree on the principle of interoperability and the commercial terms, the technical elements are already in place to allow for MFS interoperability.

In Tanzania, the Tanzania Communications Regulatory Authority (TCRA) ensured from the outset that the MNOs' systems had the capacity to be interoperable and adhered to international standards. Similarly, the National Payment System Act 2013 in Kenya requires that "[a] payment service provider shall use systems capable of becoming interoperable with other payment systems in the country and internationally" (Government of Kenya, 2013, sect. 13.1).

Supporting competitive drivers toward interoperability

In Tanzania, the government supported, but did not lead, the efforts headed by the International Financial Corporation (IFC) and MFS providers that led to MFS interoperability (Musa, Niehaus, & Warioba, 2015). Nor did it mandate interoperability at the early stages. The Electronic and Postal Communications Act

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(Government of Tanzania, 2010, sect. 28) states that

> every license holder has the right to negotiate an agreement for access to electronic communications networks and services of another license holder for the purposes of enabling the provision of electronic communications services to the public. Similarly every license holder has the obligation to negotiate such an agreement.

The Bank of Tanzania's Electronic Payment Schemes Guidelines (2007, Part 3, sect. 9.2) state that "a bank or financial institutions electronic payment schemes should be open systems capable of becoming interoperable with other payment systems in the country and should comply with the minimum international acceptable standards provided." The Guidelines also state that "the pricing policies should take into account affordability of the services to a wider market reach and that the access criteria for participating in the electronic payment scheme is transparent."

Instead, the Tanzanian government chose to subsequently formalise any agreements made by industry, through rules issued by the authorities afterwards, to ensure that interoperability, once in place, is consistent and permanent. This is also the approach advocated by the Center for Global Development (Bourreau & Valletti, 2015), who recommend

> that regulation should generally follow an ex-post approach: regulators should allow maximum scope for market development to be guided by competition between networks, while reserving a credible option for ex-post regulatory intervention should this become necessary at some point in the future in the light of market developments. The case of Tanzania illustrates how interoperability can be the result of a market solution rather than an imposed regulation. (Bourreau & Valletti, 2015, p. 1)

Similarly Nyaga (2014) asserts that

> the timing and cost-effectiveness of any regulatory intervention [on interoperability] must be appraised carefully, and market-led solutions should be the preferred option. This means that any mobile-payment platform established by a mobile provider should be open to other account holders within an agreed-upon time and that a fair basis is established for new entrants to use existing payment infrastructure. (Nyaga, 2014, p. 290)

However, experiences in similar sectors, such as telecommunications and bank payments, and lessons from concentrated MFS markets, such as Kenya, mean a supportive approach may not be sufficient to overcome barriers to MFS interoperability in all markets. Therefore, in heavily concentrated MFS markets, such as Kenya, it may be important for authorities to take a more direct approach to

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encouraging interoperability than was required in Tanzania. In this way, the ruling prohibiting agent exclusivity issued by the Competition Authority of Kenya in July 2014 may be a helpful step in the push toward full interoperability of mobile money in Kenya in the future.

Given the importance of the local market context, it is prudent for policy makers to begin, not with policy actions, but instead with an analysis of the actual competitive environment. Such analysis could be conducted by a competition authority, financial sector regulator, and/or telecommunications sector regulator, and could include analysis of the following aspects of interoperability:

- Potential benefits to consumers and market development of interoperability, to determine if these benefits merit more interventionist policies to bring about interoperability.
- Comparative analysis of interoperability arrangements in analogous high- and low-concentration MFS markets.
- The relationship between removal of agent exclusivity and interoperability, including monitoring compliance with agent non-exclusivity provisions.
- Changes in market behaviour post-interoperability, including changes in off-net and total mobile money transactions, channel access and pricing for third-parties, stored value on mobile money wallets, use of value-added services, and the number of active SIM cards across providers.
- Evaluating the scope for regulatory intervention on interconnection rates in mobile money, if needed.
- Interoperability issues for non-payment MFS, such as savings accounts tied to mobile wallets, or credit history built via borrowing on MFS channels.
- The importance of a switch between banks, between MNOs and ideally, between all providers offering financial services via mobile channels.

Data sharing in MFS

Data sharing can promote effective competition in MFS markets through reducing barriers to entry, barriers to switching and promoting innovation. Regulators can play a role through mandating and improving the standards for data sharing. New credit, savings, and insurance products are emerging in the mature MFS markets of Kenya and Tanzania. Key to the provision of these services is access to information and data on the risks that consumers represent. This makes data on consumers' voice, SMS, data, and mobile money activities incredibly important to MFS providers' ability to offer such services, and compete with each other. As these data become increasingly useful for providing these financial services, their monetary value to providers and financial inclusion potential for consumers will increase. However, current practices in many MFS markets regarding consumers' financial information restrict consumers' access to their own information, and their ability to use this information to receive competing offers in the open market. From a competition perspective, the most important elements of discussions on data sharing and data ownership in MFS

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include the following:[5]

- *Information asymmetries:* The increased availability of credit information, through credit sharing, can mitigate the problem of adverse selection, whereby lenders are unable to differentiate between borrowers of different risk. Reducing adverse selection can lead to more informed credit decisions and more effective competition in the credit market, and in turn lower lending rates and a greater availability of credit (Gine & Mazer, 2016; Mullainathan, Noeth & Schoar, 2012).
- *Barriers to entry:* When credit data are not shared between lenders, it can create a barrier to new entrants, because they will lack the richness of data that incumbent providers enjoy due to being a first mover with a portfolio of customers' data already acquired that they can credit score against (Elkhoury, 2008).
- *Barriers to switching*: A lack of credit information sharing can restrict a consumer's ability to switch providers, because rival providers are unable to assess the creditworthiness of those who are not currently their customers, restricting competition. If their provider chooses not to lend to them, or to exit the market, while failing to share credit information, the consumer may lose any future ability to borrow with another provider (FCA, 2015).
- *Innovation:* The wider availability of credit data could bring about further innovation in dynamic MFS markets (Chen & Faz, 2015; Costa, Deb & Kubzansky, 2015).

Lending through MFS is likely to grow significantly in the near future, therefore data sharing will become increasingly important for all of the reasons set out above. There is a strong rationale for regulatory action in this space at the early stage of market development, including considering the extent to which such data may be a public good that consumers can use to increase their financial access and enforcement of credit reporting rules in the MFS space.

Kenya is the leading global market for credit delivered via mobile money. It is a market where competition and financial inclusion issues related to MFS data sharing are emerging that may require policy action. For example, CGAP interviews with lenders, credit bureaus and supervisory bodies revealed that Commercial Bank of Africa was not reporting M-Shwari borrowers' positive information to the Kenyan credit bureaus for digital loans from November 2012 until May 2016, despite this being required by law, thereby precluding millions of consumers from having accurate risk assessments by other lenders and tying them closely to the incumbent lender that controls their positive borrowing history (Mazer, 2016). Similarly, terms and conditions that restrict consumers' ability to share their own MFS data, such as Safaricom restricting consumers from sharing their own transactional data accessed via its online transactional record-keeping services of Selfcare for commercial purposes,[6] are present in the market, restricting competition and consumers' abilities

5 For more information, see Bank of England (2014).

6 See, for example, Safaricom (n.d.) Clause 10.2.

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to switch lenders. These practices should be identified and prohibited by regulatory authorities. Finally, the lack of rules on sharing of MFS data may open up consumers to data risks as they seek to access a greater diversity of credit offers. For example, Branch, a digital lender in Kenya, in their terms and conditions for borrowers, requires potential borrowers to let it access all the information on the core Android operating system, which includes text messages such as the transaction receipts from mobile money providers.

Given the evidence of anti-competitive practices and consumer data security risks emerging in leading MFS markets, such as Kenya, improved standards for permitted and non-permitted use of consumers' transactional data in mobile and MFS should be a priority for competition, financial and telecommunications regulatory authorities, who will likely need to coordinate with one another in setting new standards for how data in the MFS space are owned, accessed and shared.

3. MFS regulatory authorities and competition

Given that the operators providing MFS fall under a number of regulators, how these regulators do, or do not, coordinate is very important for the effectiveness of the regulatory regime as a whole. Though countries differ, there are generally three different regulators operating in the MFS space, namely the competition regulator, the financial regulator (often a central bank), and the telecommunications regulator. Each of these regulators will differ in mandate, capacity, areas of focus, and crucially, jurisdiction. However, irrespective of jurisdictional questions, there are several important regulatory issues that authorities should focus on to ensure effective competition for MFS in their market.[7]

Issues of regulatory arbitrage across provider types and product lines

One of the identifiable barriers to competition is where providers in the same market are subjected to different regulations. The increasing number of electronic money and payment service provider regulations globally is an important step towards an open MFS ecosystem that is provider-neutral. In Kenya, the National Payment System Act (2011) takes "a functional (rather than an institutional) approach to regulation where banks and nonbanks—including Mobile Network Operators—are permitted to provide mobile money services" (Almazán & Sitbon, 2014). Similarly, the National Payment Systems Act (2015) in Tanzania provides for both banks and non-banks to be licensed and approved as issuers of electronic money, ensuring the regulations do not favour one provider type over another and reducing regulatory arbitrage.

However, neither of these Acts addresses issues of regulatory arbitrage that exist for non-payment products delivered via mobile money channels. For example, loan products can be offered by unregulated entities such as lending-only institutions in

7 For more on the appropriate regulatory setup, see Bourreau and Valletti (2015).

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both Kenya and Tanzania, as is the case in many emerging markets. This has led to regulated and unregulated providers offering similar low-value, instant loans via MFS, but with different know-your-customer (KYC) requirements, market conduct requirements (in particular pricing transparency), account opening requirements, and differing levels of supervisory oversight.

Regulatory coordination among financial, telecommunications, and competition authorities

If different provider types, who are regulated by different regulatory authorities, compete in the same market, then the various authorities will need to work closely together. Nyaga (2014) notes:

> as is the case in most other developing regions, national regulations have not kept pace with developments in the field. It is therefore imperative that regional and national authorities identify and address the gaps and potential overlaps between their existing legislative and regulatory frameworks. (Nyaga, 2014, p. 280)

This will be important so as to avoid forum-shopping and coordinate on licensing issues, supervision, and enforcement. In Kenya, memorandums of understanding have been established by the Competition Authority of Kenya with the Central Bank of Kenya and with the Communications Authority to facilitate collaboration on competition-relevant issues. This coordination will be all the more important, following the Kenyan Parliament's passing of a law that removed the Communications Authority's ability to independently declare market dominance in the telecommunications sector, and requires them to consult with the Competition Authority before making a declaration of market dominance (Okuttah, 2016).

4. Conclusion

Promoting and ensuring effective competition in MFS markets is central to promoting financial inclusion. Effective competition helps ensure that consumers will have access to high-quality, innovative, value-for-money products and services, which, in turn, will promote increased uptake and use of MFS and creates sufficient space for new innovators to enter the market and further expand the range of products offered via mobile money channels.

Competition authorities can play an important role in ensuring the development of diverse and open MFS ecosystems. As the research from Kenya and Tanzania demonstrates, there are numerous issues in MFS, where competition authorities' jurisdiction will be highly relevant. Furthermore, as these MFS ecosystems become more diverse, bringing in a wider range of industries and product types, competition authorities' market-wide jurisdiction can facilitate a fair application or rules and requirements on fair play across banks, MNOs, and other provider types. This research

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has identified several priority action areas for competition authorities in two leading MFS markets and we would advise competition authorities in other fast-growing MFS markets to conduct a similar initial analysis, to identify barriers to competition that may be hindering the development of an open, diverse, and competitive sector, that will continue to expand the horizons of financial inclusion.

Financial sector regulators can also play a role in promoting effective competition in MFS markets. They can ensure the transparency of MFS products, for example through requiring effective interest rates to be stated alongside savings and lending products. They can also promote open data, such as through mandating that both positive and negative information be shared with credit reference agencies. Financial regulators may also be well placed to ensure that consumers can easily switch MFS providers, should they wish to do so.

Finally, there is an obvious role for telecoms regulators in promoting effective competition. The current access channel of choice (USSD) sits on the telecommunications rails and therefore commonly sits in the telecoms regulator's domain. Given that MFS products are currently tied to traditional telco products, the telecoms regulator may also have a role to play in ensuring that consumers can easily switch MFS providers.

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Mobile Credit in Kenya and Tanzania: Emerging Regulatory Challenges in Consumer Protection, Credit Reporting and Use of Customer Transactional Data

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Abstract
The recent proliferation of mobile financial services in developing countries has increased access to financial services among underserved rural and low-income populations. Mobile credit is one emerging mobile financial service that allows consumers to quickly apply for and receive loans over mobile devices. Mobile credit services have achieved early success in Kenya and Tanzania, two mature markets for mobile financial services. While these new services have the potential to further promote financial inclusion, they also raise novel regulatory issues and do not fit neatly into pre-existing regulatory categories. This is due to the nature of mobile credit and the variety of entities and regulatory frameworks implicated in the business models found in these two markets. Policymakers and regulators will need to make choices about how to regulate mobile credit with respect to consumer protection, credit reporting and the use of mobile and mobile money services transactional data, a key input for credit evaluation decisions. These choices will need to take into account promotion of financial inclusion and protection of consumers while limiting disincentives for innovation and investment.

Keywords
mobile credit, mobile financial services, regulatory challenges, consumer protection, credit reporting, customer transactional data, Kenya, Tanzania

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1. Introduction: The mobile credit phenomenon

The recent proliferation of mobile financial services in developing countries has increased access to financial services among underserved rural and low-income populations. GSMA (2016a, p. 8), a global industry group of mobile network operators (MNOs), claims that mobile financial services have done more to extend the reach of financial services in the last decade, than traditional bricks and mortar banking has in the last century. Prior policy efforts to increase access had largely focused on expanding the formal banking sector and were often hampered by the high costs of building and operating physical branches and extending ATM networks (Macmillan, 2016). Today, the rapid growth of mobile networks across the developing world and the affordability of mobile devices has opened up a new, alternative, mobile channel for low-cost delivery of financial services. The regulatory approaches applied to these services are critical to their development. This article looks specifically at mobile credit, an emerging financial service that has potential to grow and further promote financial inclusion

Mobile financial services is an over-arching term for the use of mobile telecommunications technology to execute a variety of financial transactions (GSMA, 2016a, p. 66). The rise of mobile financial services has been accelerated by the advent of mobile money, a form of electronic money accessible on a mobile device that is easily convertible to and from cash via inexpensive agent networks (Aron, 2015, p.6). Mobile money services, which allow users to conduct basic payments and transfers on a mobile device using mobile money, are typically the first mobile financial services to emerge in a new market. Safaricom's M-Pesa service in Kenya is perhaps the most well-documented and successful example of a mobile money service (Eijkman, Kendall & Mas, 2010; Mbiti & Weil, 2016; Jack, & Suri, 2011).

As of 2015, there were 411 million mobile money accounts globally, with 271 live services in 93 countries (GSMA, 2016a, pp. 8-9). Some experts predict that the number of mobile money users will exceed one billion during 2016 (Kerr & Patel, 2016). Uptake of mobile money services has been particularly pronounced in Sub-Saharan Africa, in part because access to traditional financial services in the region has been limited. In 2014, 34% of adults had a mobile money account and by 2015, one in three mobile connections was linked to a mobile account. The East Africa sub-region has the highest recorded level of mobile money penetration at 55% (GSMA, 2016a, p. 32).

Mobile money services initially arose as a means of allowing the unbanked, i.e. those without traditional bank accounts, to transfer cash to relatives and others across significant geographic distances with only nominal costs. By utilising extensive mobile money agent networks to cash-in and cash-out on either end of the electronic transfer, users could avoid the expense and insecurity of having to physically transport cash from one location to another, for example via mini-bus taxi services. Over time,

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the basic transfer and payment functionality of these services served as a platform for the evolution and deployment of more advanced mobile financial services, including bulk payments (such as payment of salaries by government or other large employers), bill payment (such as school fees and utility payments), international remittances, mobile insurance, mobile savings and mobile credit.

The World Bank (2016, p. 267) has described mobile money as both a success story and a regulatory minefield. As mobile money services have emerged, they have defied old regulatory categories and raised novel issues. In particular, policymakers and regulators have had to fashion approaches that differentiated these services from traditional, highly regulated banking services, without compromising the stability and integrity of the financial system or consumer protection. The regulatory approach matters: A 2015 empirical study of 22 countries found that the appropriate level of regulation is key to the success of mobile money in a market, often playing a determining role in whether it flourishes or fails to ignite (Evans & Pirchio, 2015).

Over the last decade, regulators and policymakers across the globe have experimented with and refined various approaches to regulating mobile money services. For example, they have had to grapple with who can offer mobile money services. Some countries limit entry only to banks (Bangladesh, Ghana, India), some have allowed MNOs and other non-banks to provide these services (Kenya, Tanzania), while others only permit non-banks to offer these services when in some form of partnership or other arrangement with a bank (Uganda). Other issues that have arisen with respect to mobile money services include ensuring account balances are secure; avoiding any threat to the stability and integrity of the overall financial system; minimising fraud; terrorism financing and money laundering; promoting agent networks that are extensive, reliable and competitive; providing fair access over MNO-controlled telecommunications channels; protecting consumers; and promoting competition among providers without stifling investment. This list is hardly exhaustive.

In addition to struggling with *how* to regulate mobile money services, policymakers and regulators have had to consider *who* should regulate these services. Some regulatory issues fall squarely within the remit of the financial services regulator (for example, authorising market entry and prudential regulation), and some lie with the telecommunications regulator (for example, access to and pricing of telecommunications network services used for delivery of the services) (Macmillan, 2016). Frequently, issues arise that cross the areas of responsibility of both these sector regulators and some issues also implicate general competition and consumer protection regulators, where these have been established (for example, agent exclusivity) (Macmillan, 2016). Coordination among regulators is necessary to ensure a coherent and comprehensive regulatory approach to mobile money services.

This article discusses specifically mobile credit, an emerging mobile financial service

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that has great potential to grow and further promote financial inclusion. Mobile credit products are particularly abundant in Sub-Saharan Africa, in part because of the high level of mobile money penetration in the region, which enables mobile credit delivery (Hwang & Tellez, 2016). As of December 2015, there were 45 live mobile credit services across 16 countries, 37 (82%) of which were in Sub-Saharan Africa.[2] In 2015, seven new services were launched, all in Sub-Saharan Africa (GSMA, 2016b, p. 24).

Like mobile money before it, mobile credit is a new phenomenon that raises novel regulatory issues and does not fit neatly into pre-existing regulatory categories. For example, it is not useful to view mobile credit as merely a new development in banking or microcredit products. As discussed below, this is because mobile credit products have significant differences from traditional banking and even from newer microcredit products. Also, mobile credit provider entities may not be treated as banks or similarly regulated financial institutions for regulatory purposes. Nor is it useful to view mobile credit merely as an extension or "add-on" of existing mobile money services, like bulk payment, bill payment or international remittances. Mobile credit products are now increasingly delivered as stand-alone products without any relationship to an MNO (or the technological channels MNOs control) or any other mobile money services provider. Finally, like mobile money services, mobile credit products straddle several regulatory frameworks and sound regulatory policy will undoubtedly require coordination among regulators.

As mobile credit grows, regulators and policymakers will need to grapple with the *hows* and *whos* of regulating this new emerging phenomenon which transcends even the relatively new categories and approaches to mobile financial services developed over the last decade. This will necessarily involve considering prudential regulation, to ensure the integrity and stability of the financial system; economic regulation, to address market failure; and consumer protection regulation, to ensure that consumers have sufficient information to make informed choices. At the same time, regulators and policymakers will want to create an enabling environment that incentivises innovation and investments in these new products and the underlying technologies that drive them. Trade-offs are inevitable in addressing these diverging regulatory concerns.

This article does not advocate any particular regulatory approach, but rather seeks to frame some of the issues and choices that merit consideration. It looks specifically at three areas of concern: consumer protection, credit reporting, and the treatment of mobile phone and mobile money transactional data. In thinking through these, the

2 GSMA figures do not include airtime credit services, or services which merely allow mobile access to traditional credit products.

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article draws largely on the experiences of Kenya and Tanzania, two mature markets for mobile money services, where mobile credit products are beginning to flourish.

2. The emergence of mobile credit

The nature and unique character of mobile credit

Mobile credit generally refers to the ability of consumers to quickly apply for and receive loans over mobile devices, avoiding the time, expense and paperwork of a traditional loan application at a bank. While no formal definition has been agreed, there are several useful descriptions. Mobile credit uses "the mobile phone to provide credit services to the underserved" (GSMA, 2016b, p. 36). There are three dimensions that have been effectively digitised in mobile credit products, namely evaluation of an applicant's repayment capacity, loan disbursement and loan repayment (Hamp, Agwe & Rispoli, 2016, p. 10). This digitisation means that mobile credit has three key attributes, which differentiate it from traditional credit, namely that it is "instant, automated and remote" (Chen & Mazer, 2016). *Instant* refers to the fact that credit evaluation decisions can happen within seconds and in no longer than 24 hours; *automated* refers to the fact that decisions about credit worthiness and limitations, customer management and collections, are all automated, based on pre-set parameters; while *remote* refers to the ability to apply for loans, receive disbursements and make repayments without ever visiting a branch (Chen & Mazer, 2016). For purposes of this article, mobile credit can be thought of as those products that have all the above attributes, but not those that (i) are targeted as a credit product for mobile money agents rather than consumers, (ii) provide financing for collateralised assets[3], or (iii) are credit products for mobile airtime.

One transformative aspect of mobile credit products is the ability of lenders to leverage the available non-traditional digital data of applicants. Many applicants lack formal credit histories. This may be due to an inability to qualify for a bank loan, or it may merely reflect a non-functioning or absent credit reporting regime. When mobile credit services are linked to a mobile subscription or a mobile money account, an MNO or other mobile money services provider can make available a wealth of consumer data. This can include mobile phone usage, airtime purchase history (including airtime purchased using a credit service), and deposit, transfer, merchant payment and bill pay activity of mobile money accounts. Other useful digital data can be obtained directly from a user's smartphone, including social media, SMS and Internet browsing activity. An examination of 10 mobile credit services, nine of which were in Sub-Saharan Africa, of which seven were either in Kenya or Tanzania, found that all of these services leverage such non-traditional digital data

3 For example, a number of credit products available through mobile devices provide secured financing for solar home systems and consumer products (GSMA, 2016b, pp. 25-26).

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to inform lending decisions (Hwang & Tellez, 2016). Until an applicant establishes a repayment history with a mobile credit provider, credit evaluation decisions typically rely on non-traditional digital data to evaluate a loan application.

Obtaining user digital data is only half of the challenge of credit evaluation. Mobile credit providers need to take that data and turn it into a useful predictor of repayment in order to reliably evaluate loans applications and set appropriate credit limits. Specialty analytics firms as well as lenders' in-house teams have developed proprietary software algorithms that collect, sift through and apply appropriate weighting to this data in order to evaluate loan applications without any human review. These algorithms are often the special sauce of the individual mobile credit product, the details of which are closely guarded. In Tanzania it has been found that using non-traditional digital data and advanced analytics could reduce the delivery costs of basic microloans of around USD180 by 20-30%. The majority of savings would be generated from lower underwriting costs, lower loan application costs, as well as lower collections and risk costs (CGAP, 2014, p. 8).

Because mobile credit is unsecured and credit evaluation relies, at least initially, on the relevant algorithms, rather than on loan repayment history, it is considered higher risk than traditional bank loans. Not surprisingly, CGAP found that loan amounts are typically small (significantly less than the local equivalent of USD100), have short loan terms (typically less than a month, though some services offer terms that span several months) and are significantly costlier than traditional consumer loan products (with interest rates ranging from 2% to 10% per month) (Hwang & Tellez, 2016). Interest is often assessed as a flat fee, regardless of whether the loan is repaid early. This means that a 30-day loan, repaid in three days, could incur the full monthly interest charge, making the annualised rate astronomical. However, despite these high costs, mobile credit has become an attractive alternative to traditional microcredit services, such as those provided by micro-finance institutions and banks, which often have limited reach and flexibility due to physical constraints and high operating costs (GSMA, 2014, p. 62).

Mobile credit is often conflated with mobile banking. While the two concepts overlap, it is worth distinguishing them. Mobile banking is a sweeping concept that refers to the ability of customers to use their mobile devices as a channel for utilising services provided by licensed banks. This can include access to traditional banking products, such as balance inquiries, repayment of traditional loans, balance inquiries, deposits and withdrawals. When mobile credit first appeared, it was provided by bank partners as an add-on to the mobile money services of MNOs. Accordingly, it was convenient to consider mobile credit as a form of mobile banking offered in collaboration with a mobile money service. However, today many mobile credit providers are not banks or subject to any financial services regulation and therefore fall outside of mobile banking. Furthermore, while some mobile credit products offer

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a new source of revenue to MNOs that partner with lenders, today many mobile credit products are provided independent of MNOs or other mobile money services and are no longer add-ons.

Models of mobile credit

Over the past few years, mobile credit has diversified to encompass a variety of business models that span a variety of regulatory classifications. This article sets out four of these models, focusing on examples from Kenya and Tanzania. This is not meant to be an exhaustive list of every conceivable model, or even every model deployed, but rather discusses the models that have already achieved a measure of success, with products gaining publicity and name recognition in these two countries.

Model 1: Bank and MNO partnership

The bank and MNO partnership is the prototype for a mobile credit venture. It is the model employed by Safaricom and Commercial Bank of Africa (CBA) in their M-Shwari product, as well as by Vodacom and CBA in their M-Pawa product, the first successful mobile credit products in Kenya and Tanzania, respectively. This model was later successfully reproduced by KCB M-Pesa in Kenya. These services offer mobile savings accounts along with their mobile credit products.

As the first successful mobile credit product of its kind, the detailed workings of M-Shwari have already been well documented (Cook & McKay, 2015; Mirzoyants-McKnights & Attfield, 2015). A licensed bank (CBA) partners with an MNO (Safaricom) that also has a mobile money service (M-Pesa). The two co-brand a mobile credit product (M-Shwari), which is offered as an add-on to the mobile money service[4] and agree on a revenue sharing arrangement. The MNO provides access to customers as well as transactional data on mobile phone and mobile money usage. The bank develops a credit scoring algorithm that analyses the transactional data to make credit evaluation decisions. The actual lending is done exclusively by the bank, satisfying its identity authorisation requirements from information provided by the customer during registration of the phone number and the mobile money account (Cook & McKay, 2015). The bank carries the repayment risk and absorbs losses from non-performing loans. The credit accounts (as well as the accompanying saving accounts) are considered bank accounts for regulatory purposes. However, unlike in traditional bank loans, disbursements and repayments can only be made through the mobile money service (M-Pesa) and there is generally no connectivity with other bank accounts (Cook & McKay, 2015), though there are some exceptions.[5]

4 M-Shwari has been incorporated into Safaricom's STK menu, available (along with M-Pesa) on all phones with a Safaricom SIM card. Until April 2016, KCB M-Pesa was only accessible through USSD, but at the time of writing is now also incorporated into the Safaricom STK menu. M-Pawa is only accessible through USSD because in Tanzania M-Pesa and its related services do not utilize the Vodacom STK menu.

5 In the case of KCB M-Pesa, an exception is that deposits can be made into an account from other KCB M-Pesa accounts or from a KCB branch (Safaricom, n.d.).

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Model 2: Non-bank lender and MNO partnership

The second model is similar to the first, except that the lending entity is not a bank or similarly regulated financial institution, but rather an unregulated lender. As a result, the lender cannot offer savings accounts as a further add-on product. Otherwise, from the consumer's perspective, the mobile products under Model 2 are essentially identical to the mobile credit products under Model 1, i.e., short-term, unsecured credit, available as an add-on to an existing mobile money service.

Timiza is a successful example of a mobile credit product that follows this Model 2. Timiza was launched in Tanzania in November 2014, as a partnership between Airtel Tanzania, an MNO, and lender Jumo (formerly African Financial Business), to offer a short-term, unsecured mobile credit product linked to the mobile money service Airtel Money. Jumo is classified as a microfinance institution and thus falls outside of Tanzania's banking regulatory framework (Roberts, Blechman & Odhiambo, 2016, p. 21). Jumo also operates in Kenya, where it is considered a non-deposit taking microfinance institution and similarly also falls outside the banking regulatory framework, avoiding oversight by the Central Bank of Kenya. Airtel Kenya and Jumo have partnered to launch Kopa Cash, a mobile credit product similar to Timiza that functions as an add-on to Airtel Money accounts in Kenya. As of mid-2016, this product was in the process of being fully deployed.

Model 3: Bank utilising MNO channels

A third model for mobile credit involves banks utilising mobile channels to offer mobile credit, without partnering with MNOs or other mobile money service providers. However, as these credit services that currently operate in Kenya and Tanzania typically require links to existing traditional bank accounts, or must be secured by savings, they violate the parameters of mobile credit set out above and are arguably forms of traditional credit delivered by banks over mobile channels. While they may not strictly be considered mobile credit, they may serve as an alternative for borrowers with bank accounts. For purposes of this article, an examination of their regulatory treatment is instructive, even if only to provide context for and comparison with the treatment of *proper* mobile credit products.

One example of such a product is MCo-op Cash, a mobile wallet launched in Kenya in 2014 by The Co-operative Bank of Kenya Limited and accessible across mobile networks using USSD (The Co-operative Bank of Kenya Limited, n.d.a).[6] In addition to transfer and payment functionality, MCo-op Cash allows subscribers

6 Unstructured supplementary service data (USSD) is a session-based telecommunications channel used for transmitting data across a GSM network. Users typically initiate sessions by entering "short codes," e.g., *999# and information is presented by the service provider in the form of menus to be navigated by the user.

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to apply for loans, which are deposited directly into the wallet account (The Co-operative Bank of Kenya Limited, n.d.b). As of May 2016, three types of loans alone

are available, secured loans (secured by savings account balances), salary advances (only available to those who have repaid similar loans from Co-operative Bank) and business loans (only available to those with existing Co-operative Bank loans) (The Co-operative Bank of Kenya Limited, n.d.c).

Another example is Equity Bank's Eazzy Loans in Kenya. In order to launch a mobile banking business (including mobile money services) that could compete with M-Pesa, without the need to rely on Safaricom's USSD channel, Equity Bank obtained a telecommunications license and established Equitel, a mobile virtual network operator[7] (Mas & Staley, 2014). With an Equitel SIM card, subscribers are able to access the My Money mobile money service through Equitel's SIM toolkit (STK) menu, including the Eazzy Loan product. However, opening a traditional Equity Bank account is required to access these services (Equitel, n.d.).

Model 4: Non-bank mobile Internet application

A fourth model for mobile credit involves non-bank lenders delivering mobile credit products via smartphone apps. Smartphone usage is growing in in East Africa, with penetration reaching 19.4% as of 2015 (GSMA, 2016a, p. 32). According to Safaricom, the leading MNO in Kenya and provider of the M-Pesa service, the number of smartphones in Kenya rose 128% in 2015 to 7.8 million (Aglionby, 2016a). Under this Model 4, a credit provider has no formal relationship with a mobile money service, other than connecting to allow disbursements and payment, similar to connections made by bill pay and other third party services. By utilising mobile Internet, these products avoid reliance on MNO controlled channels such as USSD and STK. While other services, such as MCo-op Cash (see Model 3) are also available as smartphone applications, in addition to availability via mobile channels, under this Model 4, the mobile credit product is exclusively available over mobile Internet.

Branch, launched by Branch International in Kenya in 2015, is an example of a mobile credit product in Kenya utilising Model 4. Branch is an unregulated lender, falling outside of Kenya's banking regulatory framework and oversight by the Central Bank of Kenya (Hwang & Tellez, 2016). Branch is available exclusively as an Android app and collects information from a user's phone, including SMS activity, calling patterns, M-Pesa transactions, Facebook activity, GPS data and a user's contacts,

7 A mobile virtual network operator (MVNO) utilises the network infrastructure and technology of an existing MNO. Equitel utilises the network of Airtel in Kenya.

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which is analysed via a proprietary algorithm to make credit evaluations (Branch, n.d.; Google Play, n.d.a; Herbling, 2015).[8] Disbursements are made into M-Pesa accounts, though there is no partnership between the services and Branch is not an add-on to a mobile money service as in Models 1 and 2. In its first six months of operation, Branch reportedly disbursed close to USD1 million in loans (Herbling, 2016). Branch is also available in Tanzania (Google Play, n.d.a).

Another example of a mobile credit product using this model is Tala, formerly Mkopo Rahisi, a mobile credit product launched in March 2014 by US start-up InVenture (Aglionby, 2016b). Like Branch, Tala is also available exclusively via an Android app. The app scans a user's smartphone, including SMS, emails, Facebook and Twitter activity, frequency of voice calls and M-Pesa data, to collect data to determine creditworthiness (Aglionby, 2016b; Google Play, n.d.b; Mwiti, 2016).[9] Tala reportedly disbursed over KES1 billion (nearly USD10 million) in loans by the end of May 2016 (Herbling, 2016). Tala is also available in Tanzania, with plans to expand into Ghana and Nigeria in 2016 (Mwiti, 2016).

Table 1: Models of mobile credit products in Kenya and Tanzania

	Lender is a bank	Mobile money service add-on	Relies on MNO-controlled channels	Examples
Model 1	Yes	Yes	Yes	M-Shwari, KCB M-Pesa (Kenya), M-Pawa (Tanzania)
Model 2	No	Yes	Yes	Timiza (Tanzania), Kopa Cash (Kenya)
Model 3	Yes	No*	Yes	MCo-op Cash, Eazzy Loans (Kenya)
Model 4	No	No	No	Branch, Tala (Kenya and Tanzania)

** Although these bank products may be affiliated with mobile money services provided by the same bank, they are not add-ons to a third-party mobile money service.*

8 As of 30 June 2016, Branch's listing at the Google Play store states "Branch eliminates the challenges of getting a loan by using the data on your phone including your M-Pesa SMS history to verify your identity and create a credit score."

9 As of 30 June 2016, Tala's listing at the Google Play store states: "When you download Tala, we will ask to scan your M-Pesa SMS and other information in order to verify your identity, creditworthiness, and provide you the fastest loan in Kenya."

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3. Substantive areas of concern

Basis of potential regulation

Next, this article examines regulatory choices that policymakers and regulators have made, and will continue to need to address, around mobile credit. As mobile credit is a consumer financial service, it requires regulatory choices around consumer protection, prudential and economic regulation.

Consumer protection regulation is designed to protect the ability of consumers to make informed choices among competing options, by ensuring that consumers are protected from coercion, deception and other influences that are difficult to guard against (Averitt & Lande, 1997, pp. 716-717). Most obviously, consumer protection regulation can address how mobile credit platforms interact with consumers, including disclosure of pricing and other terms and conditions of loans. However, consumers need to be considered in other parts of the process, including whether and how loan defaults are reported and whether non-traditional digital data used to make lending decisions is accurate. These matters are discussed further below.

As mobile credit is a financial service, prudential regulation must also be considered. Prudential regulation is meant to protect the stability of financial institutions and the stability of financial systems as a whole (Macmillan, 2016). However, as of late 2016, there are no indications that mobile credit is of a sufficient scale to make prudential regulation of currently unregulated lenders (Models 2 & 4) an urgent concern, though this may need to be reassessed in the future.

Finally, economic regulation is meant to address significant market failures (Jalilian, Kirkpatrick & Parker, 2003, p. 11). For example, mobile credit products are often (but not always) linked to mobile money services, which are subject to network effects. When mobile money networks do not effectively interoperate, network effects may arise that can serve as a barrier to entry for new entrants (Bourreau & Valletti, 2015, p. 14). To the extent that mobile credit is linked to these networks, the market for mobile credit may also be affected. In particular, the use of mobile money transactional data as an input for mobile credit scoring may prevent market entry by those providers without ready access to this data, discussed further below.

Identifying core themes

The remaining sections of this article examine three substantive areas involving mobile credit that require regulatory choices: how to protect mobile credit consumers, whether and how to impose credit reporting obligations and how to regulate usage of non-traditional digital data. As each of these substantive areas is explored, several core themes recur which emphasise the novel regulatory challenges presented by mobile credit.

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First, mobile credit is a novel product, both in how it functions and who it targets. Never before has credit been so available, while requiring so little effort from consumers. Applicants need not have any prior credit history or any assets to secure their loan. In most cases, they only need a mobile connection and a limited trail of non-traditional digital data. This opens up borrowing opportunities to those who may not otherwise have been able to access traditional credit and allows them a stepping-stone on the path to more substantial credit. At the same time, mobile credit can be seen as a potential hazard to an unwary consumer. Those lacking financial sophistication may be tempted to take out loans they do not need or understand and may fail to understand the damaging implications of failing to repay those loans. A key challenge is how to regulate mobile credit in a way that promotes financial inclusion and prevents exploitation of unwary consumers.

Second, as the description of the various models above should indicate, mobile credit providers span a variety of entity types and partnership models, which fall under a variety of applicable regulatory frameworks. There is no obvious regulatory framework that should apply to all of these new products, and modifications to existing frameworks are likely necessary to take into account the novel features of these products. Some models are potentially regulated by multiple frameworks, which has the potential to lead to conflicting obligations for market participants and squabbling or turf battles among regulators. Other models are almost entirely unregulated, which may have been appropriate for some forms of microcredit or other services delivered over mobile channels, but may not be appropriate for the novel nature of mobile credit. In addition, the gaps in regulation of some lending entities creates opportunities for regulatory arbitrage by market participants.

Third, all regulatory interventions need to promote legitimate policy objectives, without stifling investment and innovation. Mobile credit's promise of increasing financial inclusion could easily be undercut if market participants abandon development of these products, because regulatory burdens make them unprofitable.

4. Consumer protection

Consumer protection policies are a necessary enabler of financial inclusion, ensuring that consumers are treated fairly and engendering confidence in financial services (CGAP, n.d.). The unique nature of mobile credit makes sound consumer protection provisions essential. As discussed above, the revolutionary *instant, automated and remote* nature of these products has the ability to bring credit to those who have never received formal financial services. The availability and accessibility of mobile credit products brings new risks to the most vulnerable financial consumers.

Because application for and approval of loans is so effortless for borrowers, they may be enticed to take out loans they do not need. The ease of obtaining mobile credit, coupled with aggressive marketing, at times delivered directly to a user's mobile phone, can effectively make such loans an impulse purchase. A lack of familiarity

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with financial services may mean that borrowers may not understand the price of the loans they are taking, much less be able to compare them across services or with other sources of microcredit. A lack of transparency or deliberate obfuscation can exacerbate this risk. For example, in early 2016, on the side of a building in bustling Central Nairobi, a large advertisement for a prominent mobile credit product declared in giant text "Get a loan with interest as low as 4%." However, the advertisement did not clarify anywhere that the 4% refers to monthly interest, while the annualised rate, without considering any compounding, is actually 48%.[10]

Without effective protection for consumers, mobile credit could, perversely, become an obstacle to financial inclusion for some. If defaults on mobile credit loans are reported to credit bureaus, unwary consumers may be blacklisted for failing to meet repayment conditions that they did not understand, or that they could never have met. Sound consumer protection policies are thus essential for mobile credit to fulfill its potential for extending financial inclusion.

Current consumer protection policies applicable in Kenya and Tanzania

Consumer protection provisions vary across jurisdictions. Some countries have obligations that apply to all businesses, either through a general competition or consumer protection regulator. Sector regulators often have obligations that only apply to those entities that fall under their regulatory mandate. Because mobile credit products straddle several regulatory frameworks, there will likely be disparities in applicable consumer protection regulation among the four models discussed above. A comparison of applicable consumer protection regulation in Kenya and Tanzania makes these disparities clear.

Banking regulation (applies to Models 1 & 3)

When banks are the lenders behind mobile credit, these products fall under the purview of banking regulation. Both Tanzania and Kenya have extensive regulatory frameworks that govern banking and related services, which are overseen by their respective central banks. Kenya has extensive consumer protection provisions that apply to banks, whereas Tanzania has only limited provisions. In Kenya, banks are subject to the Central Bank of Kenya Prudential Guidelines for Institutions Licensed under the Banking Act (2012), which includes the Guideline on Consumer Protection, CBK/PG/22. This Guideline is comprehensive and wide-ranging and a full review is outside the scope of this article. However, it is worth summarising some of the most relevant and noteworthy provisions relating to fairness and transparency.

The Guideline requires banks to act "fairly and reasonably in all its dealings with consumers" explain products and services "clearly in simple and ordinary language"

10 The 48% rate assumes the loan is held for the full month. If the loan is repaid early, the annualised rate can be much higher.

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and inform the customer of all "charges, fees, penalties and any other financial liability" (Guideline on Consumer Protection, CBK/PG/22, sect. 3.2.1(a), 3.2.3(a)). Banks must inform a consumer of and provide terms and conditions that highlight all fees, charges, penalties, interest rates and other liabilities or obligations (Guideline on Consumer Protection, CBK/PG/22, sect. 3.4.4). Banks must make specific disclosures regarding interest rates, including disclosing the rate, explaining how it was calculated and providing the total cost of credit (Guideline on Consumer Protection, CBK/PG/22, sect. 3.4.5).

In addition to the formal banking framework, there are other sources of consumer protection obligations in Kenya that apply only to banks. The general competition framework specifically addresses the provision of banking services, prohibiting the imposition of charges and fees that are not brought to the attention of a customer prior to their imposition or the provision of the services (Competition Act, 2010, sect. 56(3)). Also, members of the Kenya Bankers Association (an industry group that includes all commercial banks) have agreed to disclose an annual percentage rate (APR) pricing mechanism framework that includes interest rate components, bank charges and fees and third-party costs to provide loan applicants with a rate that can be compared across banks. As of July 2014, all commercial banks in Kenya were bound to disclose APR for loans as part of its required disclosure of total cost of credit (Kenya Bankers Association, 2014).

Tanzania has fewer consumer protection provisions in its banking regulatory framework. However, a bank is required to disclose fees and charges on all of its products and services at each branch and on its website (Banking and Financial Institutions (Disclosures) Regulations, 2014, sect. 11). It is not clear if a mobile credit platform would be subject to these requirements.

Competition regulation (applies to Models 1-4)

Not all jurisdictions have general competition regulators, and not all such regulators extend their mandate to consumer protection. Both Kenya and Tanzania have such regulators. In theory, these regulators would have authority over all four models of mobile credit products. However, as indicated below, while Kenya's competition regulator has taken an active role in regulating aspects of mobile financial services, Tanzania's has largely been absent.

In Kenya, the Competition Authority of Kenya is the independent regulator of competition with primary authority over competition matters in all sectors (Competition Act, 2010, sect. 5). The Competition Act, 2010 includes consumer protection provisions of general application, such as prohibitions on misleading representations and unconscionable conduct and a requirement to inform consumers of all charges and fees (Competition Act, 2010, sect. 55-57).

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The Authority has been active in the regulation of competition and consumer protection in mobile financial services. In 2014, in response to complaints from a competitor, the Authority ordered Safaricom to open up its agent network to rival mobile money services, ending its policy of exclusivity practices (Nleya & Robb, 2014). In 2015, the Authority launched a market inquiry into the pricing and conditions of USSD access offered by MNOs, focusing on any constraints in financial services and consumer protection issues (Competition Authority of Kenya, 2015). The Authority has also been proactive in approaching mobile credit specifically. It recently announced a market inquiry into the banking sector including an examination of credit reporting obligations by mobile credit providers (including non-banks) and the use of transactional data for mobile credit evaluation (Competition Authority of Kenya, 2016).

In Tanzania, the Fair Competition Commission (FCC) is the independent competition regulator with authority over all sectors of the Tanzanian economy, except where expressly excluded by subsequent legislation (Fair Competition Act, 2003). Competition legislation prohibits conduct that is misleading, deceptive or unconscionable (Fair Competition Act, 2003, sect. 18 and 25). A recent legislative amendment requires the FCC to consult with the telecommunications regulator on matters involving telecommunications.[11] However, the FCC has apparently interpreted this amendment to essentially remove issues arising in the telecommunications sector, including mobile financial services, from its jurisdiction (Roberts et al., 2016, p. 23).[12] Whether the FCC will take a similar approach to mobile credit (or any particular model) is still an open question.

Telecommunications regulation (could apply to Models 1-3)

Telecommunications regulation is another source of consumer protection obligations that may impact mobile credit providers. In both Kenya and Tanzania, the respective telecommunications regulators have had minimal involvement in regulation of mobile financial services other than requiring that the service providers have the appropriate licenses to make use of telecommunications channels. There is no reason to assume that their approach to mobile credit provided by MNOs, or over MNO-controlled channels, would be different. However, because MNOs are licensed by these regulators (Models 1 & 2), as are the service providers who use mobile channels like USSD to provide services (Model 3), these regulators may be able to apply consumer protection regulations to the services offered by these licensees. Telecommunications

11 The Electronic and Postal Communications Act, 2010 (EPOCA), includes an amendment to the Fair Competition Act, 2003 (FCA), adding: "Where, in the course of performing its functions under [the FCA], the [FCC] encounters any matter related to electronic or postal communications, as those terms are defined in [the EPOCA], it shall request the written advice of the [telecommunications regulator] on such matter and upon receiving such request, the [telecommunications regulator] shall have the power to provide the [FCC] with such advice."

12 Excluding issues relating to the review of mergers.

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regulators in other jurisdictions may take a more proactive approach to regulating mobile financial services, including mobile credit.

In Kenya, several consumer protection provisions in the Kenya Information and Communications (Consumer Protection) Regulations (2010) may be interpreted as applicable to mobile credit providers who are also telecommunications licensees. Customers of licensees have a right to "receive clear and complete information about rates, terms and conditions for available and proposed products and services" as well as "protection from unfair trade practices, including false and misleading advertising" (Kenya Information and Communications (Consumer Protection) Regulations, 2010, sect. 3). Licensees must provide a clear and understandable description of available services, rates, terms, conditions and charges for such services (Kenya Information and Communications (Consumer Protection) Regulations, 2010, sect. 10).
In Tanzania, the Electronic and Postal Communications (Consumer Protection) Regulations (2011, sect. 4 and 7) require licensees to provide consumers with information on products and services, which is complete, accurate and up to date, in simple and clear language and all promotions must clearly indicate the total charge and the terms and conditions.

Payment services regulation (could apply to Models 1 & 2)
A less definitive source of regulation of mobile credit services is through regulation of related mobile money service providers, which is often achieved through payment services regulation. Such regulations may apply to mobile credit products that are add-ons (Models 1 & 2) of mobile money services. However, at the time of writing, the author is unaware of regulators in Kenya or Tanzania applying these regulations in that way. Nevertheless, these existing regulatory frameworks contain many potential hooks for regulators to apply obligations to mobile credit providers who would otherwise be out of their reach.

In both Kenya and Tanzania, the respective central banks have led regulation of mobile money services, beginning with a flexible approach (the *light touch* approach in Kenya and the *test and learn* approach in Tanzania), based on the issuance of *no objection letters*. However, both systems have matured with the passage of payment system legislation and regulations that provide for the issuance of authorisations or licenses and include some limited consumer protection provisions.

In Kenya, the Central Bank of Kenya (CBK) regulates payment service providers, a term which includes mobile money service providers. Under the National Payment System Regulations (2014), the CBK could potentially review add-on partners as part of a payment service provider's authorisation process. In addition, a payment service provider must notify the CBK prior to adding new functionality to its mobile money services or changing "major partners in the business" (National Payment System Regulations, 2014, sect. 13(2)). Mobile money service providers also have some

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limited consumer protection requirements. For example, advertisements must be precise and easily understood, not misleading and comprehensive enough to properly inform consumers about the product (National Payment System Regulations, 2014, sect. 37).

In Tanzania, non-banks must receive licenses from the Bank of Tanzania (BoT) in order to offer a mobile money service. Under the National Payment Systems Act (2015, sect. 51) mobile money services must provide consumers with terms and conditions that are transparent, fair, legible and in comprehensible language, disclose pricing of products and services. Under the Payment Systems Licensing and Approval Regulations (2015, sect. 39), they must also "display charges, fees and terms and conditions for their services to customers prior to charging them". It is conceivable that the BoT could potentially extend its authority to add-on partners as part of the licensing process.

Consumer protection regulation (applies to Models 1-4)
Kenya has enacted a Consumer Protection Act (CPA) (2012), applicable across the Kenyan economy, which contains general prohibitions on false, misleading, deceptive or unconscionable representations (Consumer Protection Act, 2012, sect. 12 and 13). The CPA contains provisions regulating "credit agreements," regardless of whether the entity is a licensed bank, however it is not clear from the definitions whether these would apply to all loans or only to credit extended as part of a consumer transaction (e.g., a supplier credit agreement) (Consumer Protection Act, 2012, Part VII). There is no regulator specified in the CPA as responsible for enforcement. Rather, consumers are able to commence proceedings on behalf of a class of persons (Consumer Protection Act, 2012, sect. 4).

Issues in consumer protection to be considered by policymakers and regulators
The brief review of consumer protection regulations in Kenya and Tanzania set out above indicates a patchwork of regulations that may or may not apply to a particular mobile credit provider. Some obligations apply to all forms of mobile credit, but most have limited application to only a subset of the models. For example, in Kenya, while banks (Models 1 & 3) are required to make detailed disclosures on interest rates, non-banks (Models 2 & 4) are under no such obligation. Policymakers will need to decide whether consumer protection provisions should apply uniformly across all forms of mobile credit, or whether the current system is adequate.

One argument for applying a uniform set of standards rests on the fact that consumers may be unable to differentiate between the various lending entities behind mobile credit products. In 2014, CGAP conducted interviews with a range of users of M-Shwari (Kenya) and M-Pawa (Tanzania) (Mazer & Fiorillo, 2015). These mobile credit products are the first and most popular of their kind in their respective countries and are provided by CBA, a prominent bank, in partnership with the leading MNO.

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None of the M-Shwari users and very few of the M-Pawa users were aware that CBA was even involved in the mobile credit product (Mazer & Fiorillo, 2015). If users are unable to identify the lending entity behind these services, particularly one as prominent as CBA, it seems even more unlikely that they could distinguish the type of entity making the loan and understand the regulatory obligations by which it is bound. With such disparate obligations, whether a consumer receives transparent and fair treatment may simply be the accidental result of which particular mobile credit product the consumer chooses.

In Kenya and Tanzania, mobile credit providers under Model 4 (non-banks using smartphone apps) avoid banking, telecommunications and payment services regulation altogether. The general consumer protection obligations under the general competition and consumer protection frameworks were not written with effortless borrowing through mobile devices in mind and may prove insufficient to protect consumers. This potentially creates a large regulatory gap in the regulation of these entities.

Policymakers and regulators will need to consider whether it is fair or appropriate to apply widely divergent levels of consumer protection with respect to products that are functionally indistinguishable to consumers. Uniformity would create a more level playing field for competition among these services. If all of the services are subject to the same requirements on disclosure of rates, fees and other terms of service, consumers can more easily compare the services and select the one that best fits their needs. Also, uniformity in consumer protection requirements removes incentives for mobile credit providers to select regulatory structures that protect consumers least.

If policymakers and regulators choose uniformity, they will need to then determine what level of regulation is appropriate. This is not simply a matter of selecting one of the current regulatory mandates or approaches to apply to all mobile credit products. Regulators may find that the existing regulatory requirements are not well suited for mobile credit. For example, requirements that fees be posted at branches or that interest rates be displayed in terms of an annual percentage rate may not make sense for these new products. Regulators may need to craft consumer protection obligations that cater to the idiosyncrasies of mobile credit, in other words the instant, automated and remote nature of the products and the increased vulnerability of the consumer population likely to take advantage of them. These concerns will need to be balanced against a need to encourage investment and innovation. However, the requirements for transparency and fair treatment (e.g., displaying costs in an understandable way and responding to customer complaints) seem unlikely to impose burdensome costs.

Another consideration is which regulator or regulators are best placed to regulate consumer protection issues around mobile credit. Financial services regulators have expertise in regulating consumer protection for lending. However, they may be

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reluctant to extend their mandate beyond traditional banking and similar services to cover all the entity types in the market. Telecommunications regulators are typically more interested in regulating use of mobile channels rather than the content these channels provide. This may leave general competition and/or consumer protection regulators to take the lead, as CAK seems to have done with respect to other non-prudential aspects of mobile financial services in Kenya.

5. Credit reporting

Credit reporting systems are a critical element of financial infrastructure that can help to reduce the costs of financial products and increase their availability to consumers (IFC, 2012, pp. 3-5). At their core, they consist of databases of information on borrowers, supported by a technological and legal framework (World Bank, 2011).

Three benefits of credit reporting systems stand out as valuable to healthy financial sectors.

First, functioning credit reporting systems can reduce the costs of borrowing. These systems reduce information asymmetries between borrowers and lenders by providing lenders with objective information that can be used to efficiently and effectively evaluate borrowers. This can reduce portfolio risks and transaction costs (for example, by eliminating the need for collateral) and these savings can, under competitive pressure, be passed on to borrowers (IFC, 2012).

Second, these systems can increase financial inclusion. Consumers do not need to have a history of prior transactions or a personal relationship with the institution from which they wish to borrow. Rather, a consumer can leverage a prior history of payments with any other reporting institution as a means of demonstrating creditworthiness to a new lender. In addition, because credit reporting systems aim to provide objective information on borrowers, they may benefit segments of the population that may have been denied credit due to prejudice (World Bank, 2011, p. 7).

Finally, and relatedly, these systems serve as a means of enabling competition between financial institutions. Because credit reporting makes credit histories generally accessible to all lenders, consumers are not locked into borrowing from those institutions with which they have a prior relationship. In theory, consumers can shop around and choose the best rates and other features that meet their needs. This should promote competition among lenders and a diversity of loan products, reducing the costs of lending and providing consumers with greater choice.

Reporting requirements for mobile credit providers are likely not uniform

Credit reporting obligations applicable to mobile credit providers vary across jurisdictions, but often depend on the type of entity making the loans. As there are

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a variety of lender-types providing these products, the reporting requirements are likely not uniform across the market. Kenya and Tanzania provide good examples of these disparities.

In Kenya, all banks must report both positive and negative credit information on consumers to Kenya's three credit reference bureaus (Credit Reference Bureau Regulations, 2013, sect. 18). Creditors that are not banks or similarly regulated financial institutions have no obligation to submit any credit data to the bureaus. However, these "third parties" are permitted, but not required, to submit positive and negative credit reference information to credit bureaus, if they are approved by the Central Bank of Kenya (CBK) and obtain the consent of a customer (Credit Reference Bureau Regulations, 2013, sect. 23).

The credit reporting system in Tanzania is significantly less developed than in Kenya. As of early 2016, there were two credit reference bureaus in Tanzania, although neither was fully functional (Roberts et al., 2016, p. 26). The Bank of Tanzania has established the Credit Reference Databank (CRD), which receives, stores, processes and distributes credit information to the credit bureaus (Bank of Tanzania (Credit Reference Databank) Regulations, 2012). Only banks and similarly regulated financial institutions are required to report credit information on new and existing credit facilities to the CRD (Bank of Tanzania (Credit Reference Bureau) Regulations, 2012). Other lenders have no reporting obligations.

Issues in credit reporting to be considered by policymakers and regulators

Policymakers and regulators will need to consider the role of mobile credit in the credit reporting system. As a threshold issue, they must determine whether mobile credit providers should participate in the reporting system and how to ensure that such reporting takes place without stifling innovation and investment. There are potential benefits and challenges to their participation.

A major potential benefit is that credit reporting by mobile credit providers has the promise of bringing large numbers of otherwise excluded consumers into the credit reporting system. As described above, mobile credit providers often use available non-traditional digital data (mobile phone or mobile money history, smartphone data) for evaluating initial loans, which allows them to lend to those with no credit history. If timely repayment of mobile credit loans is reported into the credit reporting system, it can help build a credit history for borrowers that can be leveraged for more significant loans from traditional lenders. Similarly, a history of late payments or defaults on mobile credit loans can help to alert lenders that a borrower is high risk. Accordingly, credit data reporting by mobile credit providers can help extend traditional credit to new borrowers, while also lowering overall borrowing costs.

There are also potential challenges to mobile credit providers participating in credit

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reporting. First, credit reporting systems are often designed to accommodate data on longer-term loans, with periodic (e.g., 30 days) obligations on lenders to update information. Mobile credit loans can have terms as short as 24 hours and a single borrower may take out numerous loans in a month. Mobile credit providers, as well as credit bureaus and regulators, may face technical difficulties integrating this type of information into a traditional credit reporting system that is updated monthly.

Second, credit reporting systems typically impose obligations on lenders beyond simply the obligation to report. These include instituting mechanisms to allow consumers to access, challenge and correct inaccuracies in their histories. Because mobile credit loans are of such small value, these obligations may impose disproportionate costs on mobile credit providers, stifling innovation or increasing borrowing costs and undermining the benefits these new services bring to financial inclusion.

Third, market participants may argue that requirements to report credit data on mobile credit would undermine competition in the market for these services. As discussed above, mobile credit providers rely on proprietary algorithms to evaluate available transactional data of borrowers with no traditional credit history. The ability of a mobile credit provider to obtain this data, and the usefulness and accuracy of these algorithms to turn this data into a credit score, are two of the key differentiators of these providers. Some mobile credit providers have argued that requiring credit information reporting would undermine investments in innovation. For example, mobile credit provider X may invest resources in establishing a relationship with an MNO to receive mobile phone and mobile money transactional data on a customer. The same provider may also invest significantly in an algorithm to process this data for credit evaluation. However, if the repayment history for this providers' customers were available through credit bureaus, other providers may piggyback on this investment. Mobile credit provider Y may decide to only give loans to those consumers with a history of repayment of a loan from provider X because it would know that provider X had used its algorithm to score transactional data that indicated that the borrower was creditworthy. The history of the issuance of the loan by X becomes a proxy for the expensive collection and analysis of data that would otherwise be required. The potential for competitors to essentially "free-ride" on a product's evaluations may serve as a disincentive for investment and improvements in such products.

As in the case of consumer protection, a threshold consideration is whether mobile credit providers should have uniform reporting obligations, regardless of the regulatory status of the lenders. For example, reporting obligations in Kenya and Tanzania currently only apply to mobile credit products offered by banks. This may create an unfair playing field and distort competition in the mobile credit market, as non-banks offering similar products have a lower cost of regulatory compliance. Maintaining the disparities in these obligations may further incentivise the creation of products that avoid reporting obligations, as entrants are likely to favour models

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with lower costs and lighter regulatory obligations. Such regulatory arbitrage may undercut policy goals of increasing financial inclusion as the market becomes weighted towards products that have no reporting obligations.

If policymakers and regulators decide to require uniform credit reporting, then the level of such reporting obligations is another factor to consider. Even if some credit reporting is seen as beneficial, those obligations that were designed to apply to banks may be seen as overly burdensome for these new products. Policymakers and regulators may explore more flexible and less burdensome obligations that take into account the small loan amounts and short terms of the loans.

6. Availability of mobile and mobile money services transactional data

Another issue for policymakers and regulators to grapple with is the availability of customer transactional data generated by use of mobile services and mobile money services of MNOs. This non-traditional digital data is particularly valuable for mobile credit analytics as it includes a customer's mobile phone subscription history (airtime purchases, airtime extended by credit, call times, etc.), as well as mobile money transactions history (payments, transfers, bill pay, salary disbursements, etc.). This information, which yields insights on consumer attributes, such as liquidity, regularity, scale of cash flow and payment obligations and breadth of social network, has proven valuable in assessing credit risk.

In both Kenya and Tanzania, this data is not considered part of the credit reporting system. Accordingly, MNOs have no obligation to share this information with credit bureaus or to allow customers to review and correct this information. As of late 2016, this data is only shared by MNOs with mobile credit providers in the context of a partnership between the MNO and a lender (Models 1 & 2). Policymakers and regulators will need to take a view on whether this data should remain under the exclusive control of the MNOs, or whether third parties and/or consumers should have access. In Kenya, as of late 2016, the issue of consumer access is being examined by Competition Authority as a facet of phase II of its market inquiry into the banking sector (Competition Authority of Kenya, 2016, p. 248).

One consideration is that this non-traditional digital data is being used as a key input for mobile credit decisions and consumers should therefore have a right to ensure that it is accurate. It is possible that the transaction histories utilised by MNO lending partners may contain errors, be incomplete or include information from a misidentified consumer. Because consumers are unable to review or challenge this information, they risk being unfairly blacklisted from mobile credit services, which may otherwise serve as a stepping-stone to building a credit history and accessing more significant credit or other financial services. This issue is even more salient in a mobile money market like Kenya, where one service, M-Pesa, accounts for the overwhelming number of mobile money transactions and may be the only source of

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useful mobile money transactional data.

The United States Federal Trade Commission (FTC) addressed a similar issue when it recently clarified the use of big data in credit reporting decisions. Under the US Fair Credit Reporting Act, consumer reporting agencies (CRAs) that compile or sell consumer reports, used for credit and other decisions, must implement procedures to ensure maximum accuracy of such reports and provide consumers with the ability to correct any errors (FTC, 2016). The FTC clarified that data brokers that compile "non-traditional information, including social media information" may be considered CRAs subject to these obligations (FTC, 2016, pp. 13-15). The companies who obtain and use these reports for credit decisions also incur obligations, including supplying an adverse notice to consumers if they are denied credit on the basis of such data (FTC, 2016). If a similar approach to non-traditional digital data were taken in developing countries, where mobile credit is beginning to flourish, MNOs and their mobile credit provider partners (Models 1 & 2) could be subject to access obligations similar to those applicable to credit reporting information.

Other concerns around the use of non-traditional digital data for credit decisions are competition and policy based. For example, if an MNO is dominant in mobile and mobile money markets, it may be the only entity in the market with sufficiently robust mobile and mobile money transactional data. The dominant MNO could partner with one or more lenders that provide add-ons to its mobile money service (Models 1 and 2) and exclude all other competing mobile credit services. This could further entrench its dominance in mobile and mobile money markets. Furthermore, to promote financial inclusion, policymakers may deem it essential that consumers have access to this MNO information and share it with lenders.

Some of the concerns around the use of transactional data will be alleviated by the emergence of the non-bank mobile Internet apps for smartphones (Model 4). These mobile credit providers are able, with a consumer's permission, to extract information on voice, SMS and mobile money activity directly from a consumer's device. In effect, this subverts the monopoly that MNOs have on this information, permitting consumers to directly share accurate, verifiable versions of this information with mobile credit providers for credit evaluations. Also, in some cases, these mobile credit providers may be able to access histories of loan disbursements from competing mobile credit providers that have partnered with MNOs, as these may leave a record on a smartphone through SMS confirmations. This may raise similar concerns over free-riding described above, with respect to credit reporting.

The benefits made possible through smartphone apps require widespread adoption of smartphones, particularly among the low-income and rural populations that are targeted by financial inclusion. While globally, 45% of mobile connections were smartphones in 2015, in Africa this number was only 23% and in the East Africa

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Community it was only 17% (GSMA, 2016c, pp. 13, 19). Accordingly, it is likely that the rise of these smartphone applications will not relieve policymakers and regulators of the need to address the use of mobile money transactional data for many years to come.

7. Conclusion

The emergence of mobile credit products has the potential to increase access to financial services, particularly in sub-Saharan Africa. However, like the emergence of mobile money services over the last decade, these new products challenge existing regulatory categories and approaches. This is complicated by the fact that mobile credit is offered by a variety of entities and/or partnerships, which are subject to different regulatory frameworks. Policymakers and regulators will need to consider how best to regulate mobile credit, using the tools of consumer protection, prudential and economic regulation to promote financial inclusion and protect consumers, without stifling investment and innovation.

Regulation of consumer protection, credit reporting and availability of MNO transactional data are three substantive concerns linked to the emergence of mobile credit. However, as exemplified by the patchwork of applicable frameworks in Kenya and Tanzania, these concerns are not yet addressed comprehensively or coherently. Policymakers and regulators will likely need to reconsider outdated regulatory approaches in order to enable mobile credit to fulfil its potential.

First, the novel nature of mobile credit raises novel concerns for consumers. Credit is available immediately and on demand, without the need to visit any branches or agents, wait in line, or fill out forms. The ease of use of these services has, in some cases, essentially turned credit into an impulse purchase. Moreover, these products are often targeted at the most vulnerable and least financially educated. Regulatory frameworks need to protect consumers in a sensible way that addresses the realities of this new technology, without stifling innovation.

Second, the regulatory frameworks need to advance policies of financial inclusion. Mobile credit repayment histories can potentially serve as a stepping-stone to for borrowers to access larger credit volume. In order to accomplish this, mobile credit needs to be included in credit reporting systems in a way that furthers these policy goals, without exploding the costs of mobile credit, or unfairly punishing the financially uneducated for mistakes. In addition, disparate reporting obligations among mobile credit providers, based on entity types, risks distortions in competition and regulatory arbitrage.

Finally, mobile credit has thus far relied heavily on mobile and mobile money transactional data. If this reliance continues and has implications for policies promoting availability of credit and financial inclusion, policymakers and regulators

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will need to consider whether use of this information needs more oversight, and whether consumers should have greater rights to review and challenge this data.

The patchwork nature of the current regulatory frameworks presents significant challenges, particularly for consumer protection. These include the likelihood of conflicting obligations for market participants, regulatory gaps and incentives for regulatory arbitrage. However, the wholesale creation of a comprehensive regulatory framework to address mobile credit may be too costly. Much can be achieved through coordination among regulators, particularly as mobile credit straddles several regulatory frameworks. Often coordination among regulators is mandated, particularly between sector and general competition regulators, as regulators are required by law to consult with one another. However, regulators can also be proactive and enter into memoranda of understanding that define obligations on consultation, joint investigations and sharing of confidential information. Prudent coordination can reduce duplication of resources where powers overlap; reduce duplication and conflict between regulators' investigatory actions and competitive behaviour; and permit regulators to draw on one another's strengths (Macmillan, 2016). Such coordination among financial services, telecommunications, competition and consumer protection regulators is essential to meet the regulatory challenges presented by mobile credit.

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The "Evolution" of Regulation in Uganda's Mobile Money Sector[1]

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Abstract
Uganda's mobile money sector has grown rapidly since its introduction in 2009. As at the last quarter of 2015, there were 21.1 million registered mobile money users in the country, representing a penetration of about 54%. As well as providing a convenient, cheap and safe means of money transfer, mobile money has spurred increased financial inclusion, which grew from 28% in 2009 to 54% in 2013. The rapid growth has happened under conditions of "light touch" regulation of the sector, which allows the first mover to reap the rewards of investments made, but raises potential competition issues. The mobile money sector, much like the telecommunications sector, is characterised by network externalities, lock-in effects and high barriers to entry that can give rise to a concentrated sector with a single dominant player. This article considers the effect of light touch regulation on the competitive dynamics in the mobile money market in Uganda and contrasts this with the experience in Tanzania, where regulation evolved from a light touch style to a more comprehensive framework as the sector grew.

Keywords
mobile money, regulation, competition policy

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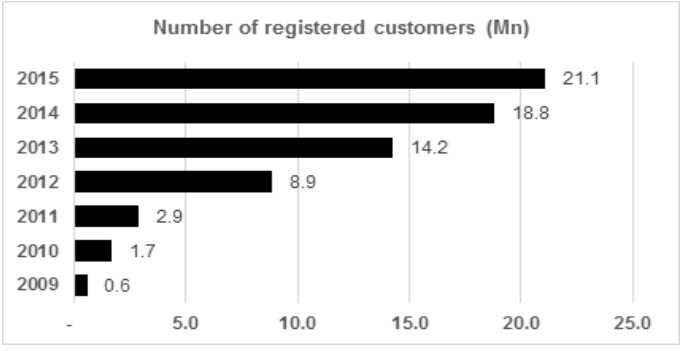
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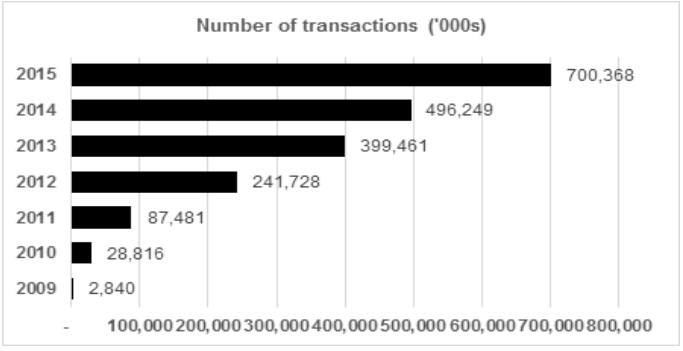
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1. Background and introduction

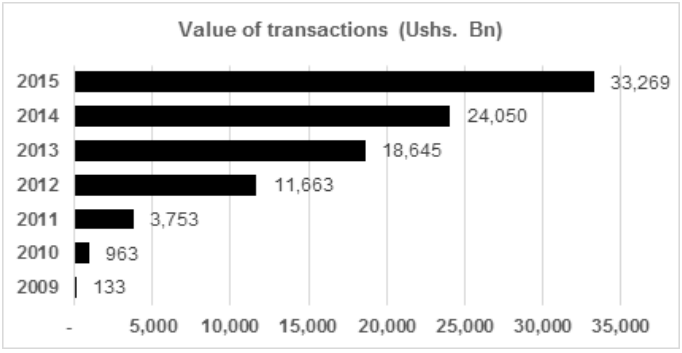
Mobile money has been a fast-growing phenomenon in the East Africa region and Uganda is no exception. The number of registered mobile money subscribers in Uganda grew from about 600,000 in 2009, when mobile money was introduced, to over 21 million at the end of 2015, and the numbers and value of mobile money transactions also showed strong growth (Figure 1). This success has been partly attributed to the relatively light touch regulation governing the mobile money sector in Uganda, one of the four factors in the success of mobile money identified by Evans and Pirchio (2015) for take-off and explosive growth, along with poor infrastructure, the simultaneous growth of mobile money users and agents, and acceptance. These features are common to the eight countries (including Uganda) where mobile money has succeeded, out of the 22 countries studied by those authors. In this context, light touch regulation refers to minimal limitations on who can operate a mobile money scheme and allows for mobile network operator (MNO)-led mobile money, rather than bank-led schemes which have generally not succeeded. The regulatory provisions include light know your customer (KYC) requirements and minimal restrictions on who can act as an agent (Bourreau & Valletti, 2015).

Figure 1: Growth in mobile money customers, and in number and value of transactions





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Source: BoU (2015); UCC (2013, 2014, 2015 and 2016)

One of the consequences of this rapid growth may be the emergence of a dominant firm, as there are strong first mover advantages, high barriers to entry and network externalities in mobile money markets, as there are in telecommunications. Indeed, in the "MNO-led model", one of the mobile telecommunications companies will likely gain this position in mobile money services. Light touch regulation may allow high rewards for the investment the company makes in building a platform for users, where it is unconstrained in earning returns and can bolster its position in mobile telecommunications. Its rivals may be unable to catch up in the absence of interoperability between mobile money platforms.

Competition theory has shown that lack of competition may lead to high prices and reduced incentive to innovate (Banda, Robb, Roberts & Vilakazi, 2015). Dominant players may also have the incentive to abuse their dominance by taking part in anti-competitive conduct, such as margin squeeze, in order to foreclose possible entrants in downstream markets and guard abnormal profit (Mazer & Rowan, 2016). In such instances, existing regulation needs to be able to address any possible anti-competitive behaviour and encourage competition.

Uganda's mobile money sector development provides the basis for a case study in which to assess the challenges of regulation, as the extension of mobile money is characterised by the presence of a strong market leader and limited regulation. This article explains the structure and regulatory framework of mobile money in Uganda; then assesses the interaction of regulation and competition, identifying key competition bottlenecks, which could be addressed by regulation; before analysing them in the specific case of Uganda. The article concludes by considering what regulatory approaches might lead to more competitive outcomes in the sector.

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Mobile money market structure

Mobile money was introduced by MTN Uganda, in March 2009, as a customer retention strategy, following intensifying competition from a new entrant, Warid Telecom, which used aggressive on- and off-net discounting to build a customer base (sector participant, personal interview, 19 January 2016). Currently, four mobile network operators (MNOs) are providing mobile money solutions: MTN Uganda through MTN Mobile Money, Airtel Uganda through Airtel Money, Africell Uganda/Orange Uganda through Africell Uganda Money, and Uganda Telecom through M-Sente. A number of non-MNO mobile payments providers, such as MCash, EzeeMoney, and Smart Money, have also entered the mobile money space (BoU, 2015).

Airtel Uganda was the second MNO to introduce mobile money in June 2009, a few months after MTN Uganda. M-Sente was launched in March 2010. Warid Pesa began operations in December 2011 and Orange Money[2] was launched in the first half of 2012 (Ggombe, 2014). Airtel Uganda later merged with Warid Telecom in 2013. In terms of mobile money subscriber numbers, MTN Uganda has maintained the largest share of 58.4% in 2015, followed by Airtel Money with 27.2% (Table 1). However, MTN Uganda's leading position is likely to be much stronger if one considers the amount and volume of transactions, with figures showing MTN Uganda as having a share in terms of usage of 72% (Figure 2). This is because as many as 40% of subscribers have two or more SIM cards, but mainly use one of them (FII, 2014). Customers often subscribe to services they will not use, if that subscription is free, particularly for new technologies. The market shares in Table 1 thus underestimate MTN Uganda's market share and dominance.

Table 1: Statistics for mobile operators with mobile money services in March 2015

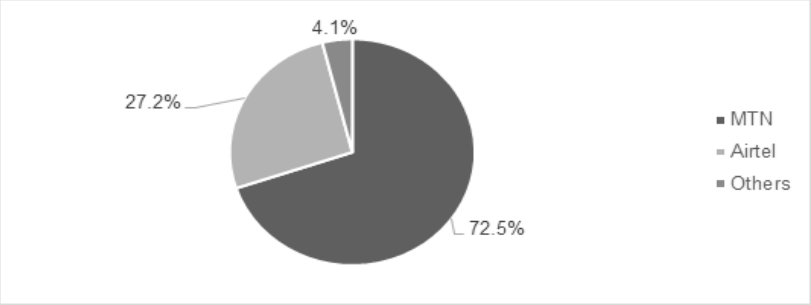
Mobile network/ mobile money service	Mobile subscribers (millions)	Mobile money subscribers (millions)	Market share %
MTN Uganda/MTN Mobile Money	10.4	7.3	58.4
Airtel Uganda (Warid)/Airtel Money	7.5	3.4	27.2
Uganda Telecom/M-Sente	9.8	1.3	10.4
Africell Uganda (Orange) Uganda/ Africell Uganda Money	0.6	0.5	4
Total	20.5	12.5	100

Source: Okwii (2015a)

2 Orange Money was acquired by Africell Uganda and is now known as Africell Uganda Money.

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Figure 2: Utilisation of mobile money services by service provider in 2013 (%)



Source: EPRC (2013)
Note: This is based on a survey which asked respondents about their usage.

In order to provide mobile money services, providers are required to partner with a commercial bank[3] (UCC, personal interview, 19 January 2016). The banks hold an escrow account on behalf of the MNO, mirroring the mobile money deposits held. MTN Uganda initially partnered with Stanbic bank; Airtel Uganda with Citibank and Standard Chartered; Orange Uganda with Standard Chartered; and Uganda Telecom with DFCU and PostBank (Okwii, 2014). Today, individual MNOs partner with several banks to effect mobile banking and payments. MTN Uganda, for example, is partnered with eleven financial institutions (MTN Uganda, 2015). The banks have not themselves been active mobile money providers in Uganda. This may change with the introduction of agent banking, which became lawful in early 2016 (Muhumuza, 2016).

Aggregators also play an important role in the mobile money sector. When mobile money services were first introduced, the providers realised that platforms with particular functionality and capacity were required to run the services efficiently (McGrath & Lonie, 2013). The basic platforms used for GSM services did not have sufficient capacity or the ability to manage additional mobile money requirements. Functionalities required by mobile money platforms include customer activities such as cash-in and cash-out, purchase of airtime, transfer of money, bulk payments, bulk transfers and bill payment; agent activities, and business reports and MNO activities (McGrath & Lonie, 2013). In Uganda, as in many countries, aggregator companies play this role by developing, running and maintaining the necessary platforms to run these mobile money services. These companies develop innovative products and platforms to ease e-commerce and mobile money payments or transfers. Some

3 As discussed in more detail in the section on the regulatory landscape below, the mobile money sector is currently regulated via a set of Mobile Money Guidelines published by the Central Bank of Uganda.

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of these include Yo! Uganda Ltd, Beyonic, EzeeMoney, Remit, Payway and Jpesa (Okwii, 2015b).

History and evolution of service offering

Uganda's mobile money market remains primarily a person-to-person transfer and payments market. The range of services has, however, expanded to include the remote purchase of airtime, bill payments for utilities, solar power products, school fees, university fees, taxes, parking, insurance premiums, national lottery, pay-TV services payments, bulk payment of salaries, international remittances, and savings.

The development of mobile payments services has followed the pattern of mobile money. By 2015, the majority of utility payments were carried out using MTN Uganda mobile money services, which facilitate an average of 71.4% of all utility payments monthly (MTN Uganda, 2015). The mobile money providers have now also partnered with banks to enable withdrawals at ATMs. However, person-to-person transfers are still by far the most important service, accounting for 90% of MTN Uganda's mobile money revenue in 2015 (MTN Uganda, personal interview, 21 January 2016).

Mobile savings and loans were launched in late 2016, some four years after Kenya and two years after Tanzania. In August 2016, MTN Uganda launched micro-savings and microloan services, MoKash, in partnership with Commercial Bank of Africa (CBA) (Ochwo, 2016). The product allows MTN Uganda mobile money customers to start a savings account from as little as UGX50 (approximately USD0.01) and earn interest of between 2% and 5%, depending on the amount saved (Ochwo, 2016). The interest on the saving is accrued and paid quarterly and the customer can schedule to deposit into the savings account automatically on a daily, weekly, or monthly basis (Dignited, 2016). Airtel Uganda and Uganda Telecom have also been working on developing savings and loan products.

The MoKash platform allows customers to apply for short-term loans of between UGX3000 and UGX1 million (approximately USD1 and USD300), depending on the customer's credit limit, which is determined with reference to a customer's usage of other MTN Uganda services (voice, data and mobile money). Customers do not need to open a bank account to access the MoKash service but can simply register for the services over the mobile money platform. Activation and transactions between MoKash and MTN Mobile Money are free for both savings and loans, but loans attract an interest rate of 9% for a period of 30 days. Thereafter, a penalty of a further 9% may be lodged against a defaulter (Dignited, 2016).

Uganda does not permit outgoing cross-border mobile remittances, largely due to regulatory barriers relating to foreign exchange controls. Mobile remittance products for the East African Community have been developed in Uganda and applications

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have been submitted to the Bank of Uganda (BoU) for approval. However, due to lack of explicit regulation to provide for compliance and enforcement measures for mobile money products generally and a lack of capacity and procedures to evaluate product innovations, the products were not yet available at the time of this study (BoU, 2015). The BoU submitted a proposed amendment to the Foreign Exchange Act of 2004 to address these gaps. In the interim, the BoU was evaluating applications to launch new products on a case by case basis (BoU, 2015). Following the signing of a memorandum between MTN Uganda and Safaricom in December 2015, inward mobile money transfers (MMT) could be made from Kenya through Safaricom to an MTN account in Uganda (Chao-Blasto, 2015).

With the continued integration of the East African community, the introduction of "one area" roaming and products that allow for cross-border transactions are increasing in importance. Tanzania, Rwanda and Kenya have launched cross-border remittance services. In Tanzania, Tigo provides for international transfers between Tigo Pesa accounts in Tanzania and Tigo Cash accounts in Rwanda (Roberts, Blechman & Odhiambo, 2016). Similarly, in March 2015, Vodacom launched international transfers between M-Pesa accounts in Tanzania and M-Pesa accounts offered by Safaricom in Kenya. In August 2015, Tigo partnered with WorldRemit to allow its subscribers to send and receive remittances internationally.

Regulatory framework

The mobile money industry in Uganda is overseen by two regulatory authorities, the BoU and the Uganda Communications Commission (UCC). Only one regulation specifically targets the mobile money sector in Uganda, namely the Mobile Money Guidelines issued by the BoU in 2013. Its legal status is ambiguous, although it is generally treated as if it is binding. A National Payments System Act has been drafted, which would govern mobile financial services, amongst other matters, but it is yet to go through parliamentary approval processes (BoU, personal interview, 20 January 2016). The BoU has authorised mobile money services by issuing "no-objection" letters to the commercial banks, who partner with the MNOs, and requires the bank to hold the balances recorded in the mobile wallet in an escrow account.

Mobile banking services (with savings and loans) require separate approval. The individual mobile money subscriber now, in effect, opens a bank account with the partner bank. Effectively, the BoU regulates the MNO indirectly through the partner bank, having the ultimate power to withdraw the bank's license in cases of irregular conduct by the mobile money provider. This indirect mechanism of regulating mobile money services applies in the absence of a more comprehensive regulatory framework that might license the mobile money provider directly. It arose as technology evolved more quickly than the regulatory regime, which then had to play catch-up. The mobile money guidelines were effectively introduced as an interim measure to govern the industry.

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Mobile money services are usually provided by MNOs, which puts some aspects of their activities and services under the purview of UCC, although the UCC has not played an active regulatory role in relation to mobile money services. The UCC is mandated by the Communications Act, No. 1 of 2013 to undertake a number of functions in relation to licensing, tariff regulation, competition, spectrum management and economic regulation. There is no competition regulation regime in Uganda. However, the Communications Act gives the UCC authority to regulate an extensive range of competition issues in the telecommunication sector. One of the UCC's functions is "to promote competition, including the protection of operators from acts and practices of other operators that are damaging to competition, and to facilitate the entry into markets of new and modern systems and services" (Parliament of Uganda, sect. 5(1)(n)). Section 53(1) of the Communications Act prohibits "activities, which have, or are intended or are likely to have, the effect of unfairly preventing, restricting or distorting competition in relation to any business activity relating to communications services" and section 53(2) prohibits abuse of a dominant position, including abuse "which unfairly excludes or limits competition between the operator and any other party." An abuse of dominance also includes "entering into an agreement or engaging in any concerted practice with any other party, which unfairly prevents, restricts or distorts competition", as well as anti-competitive mergers and acquisitions (sect. 53(2)(b) and (c)). The UCC has the power to investigate breaches of fair competition and may issue stop orders, impose fines up to 10% of an operator's annual turnover, and declare anticompetitive agreements or contracts null and void. These are strong enforcement powers by any measure, although they have not been used in relation to mobile money services.

The mobile money guidelines also address competition issues, prohibiting exclusivity between banks and MNOs, and between MNOs and their agents. The latter has been the subject of a competition investigation by the Competition Authority of Kenya in that country (Ochieng', 2014).

2. The interplay of regulation and competition in mobile money

Mobile money technology has grown faster than regulation, and policy makers have had to consider a number of regulatory issues, such as which entities are allowed to provide these services, the security of the technology, the possible effect on the stability of the financial system, fraud, competition, provision of access to essential telecommunications infrastructure and promotion of competition, among other things (Macmillan, 2016). Additionally, regulators have had to consider which mobile money issues fall under the financial regulator and which fall under the telecommunications regulator. The general consensus appears to be that there is a need for coordination between the two sector regulators, as well as with the competition and consumer protection regulators, to ensure that the majority of the issues identified above are addressed (Macmillan, 2016).

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In simple terms, two regulatory models of mobile money predominate: the bank led model, or the MNO-led model (Hernandez, Bernstein & Zirkle, 2011; Suárez, 2016). The track record suggests that the MNO-led model has been more conducive to the growth of mobile money (Evans & Pirchio, 2015). While the bank-led model has controls to mitigate risks and ensure data security, banks are often slow to innovate and respond to the needs of the market (Hernandez et al., 2011). Regulations under the bank-led model tend to be much stricter and have inhibited mobile money growth.

The MNO-led model has often been more accessible to the poor, due to distribution capabilities of MNOs compared to banks, and less restrictive in terms of regulation. One concern about the model has been the susceptibility to customer or agent fraud, and competition issues that arise where MNOs control the means of delivery of services by their competitors. It is this model, however, that has been largely present in countries that have experienced successful growth of the mobile money sector (Evans & Pirchio, 2015).

While the often light touch regulation that characterises the MNO-led model has facilitated growth of the sector, it raises questions about regulation on competition grounds, given the implications of network effects, barriers to entry and economies of scale. The mobile money sector requires significant levels of capital investment, due to the amount of infrastructure required and is thus characterised by high sunk costs. These costs create high barriers to entry and result in first mover advantages for the first mobile money provider to venture into the sector.

Mobile money is subject to network effects, those which are inherent in the telecommunication sector, and those of mobile money services themselves (Bourreau & Valletti, 2015). Network effects exist where the utility derived from consuming a product increases, as more users consume that product. In telecommunications, for example, the more people that are connected to the network, the more useful it becomes, because more people can communicate with each other (Rohlfs, 1974). In mobile money, the value of a mobile money platform increases, as more people accept and use the platform, because more people can make more transfers and payments to a larger number of recipients. There is a positive externality as a user is added to a network, as this generates a benefit to all the existing users (Katz & Shapiro, 1985). Where networks interoperate seamlessly, without significant additional cost, the combined network effect is shared among the interoperating networks. But where there is no interoperability, or where it is costly to send traffic to or transact across the other network (a substantial difference between on-net and off-net charges), the larger network will have a competitive advantage simply by virtue of its size and can effectively lock-in customers (Farrell & Klemperer, 2007).

Related to network effects is the phenomenon of two-sided markets. Two-sided

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markets occur when two different sets of users interact through the same platform and for which the decisions of one user group affects the outcomes faced by the other group (Rysman, 2009). The different user groups derive benefits from being connected using the same platform, as is the case in the mobile money sector (Armstrong, 2006). The mobile money sector is a clear example of a two-sided market, where both agents and subscribers derive benefit from interaction on the same platform. The increase in the number of agents on one side of the market results in the increase of subscribers on the other side of the market. A platform is only successful if it attracts both agents and subscribers simultaneously (Evans & Pirchio, 2015). The platform must grow in such a way as to attract new clients, but maintain the interest of early adopters. Once this growth reaches critical mass, with both agents and subscribers growing simultaneously, the value of the existing users is sufficient to attract new users (Evans & Pirchio, 2015).

Due to network externalities, the incumbent network is more likely to attract consumers, agents and merchants with regards to mobile payments. The incumbent network represents greater opportunity for them for higher volumes of transactions. In addition, to the extent that the sector is also subject to economies of scale, the incumbent network may be able to provide the service at a lower cost than new entrants. The high barriers to entry and network externalities identified above can lead to a concentrated sector, as is the case in Uganda (Table 1 and Figure 2).

The structure of the mobile money sector discussed above may result in competition bottlenecks in certain levels of the value chain. Four main areas of concern can be identified (Sitbon, 2015):

- *Connectivity:* Until greater penetration of smart phones is achieved, there are two main ways in which mobile money services can be provided: through unstructured supplementary service data (USSD) or through short message service (SMS) (Bourreau & Valletti, 2015). These are the means by which a user may send or receive messages concerning money transfer. The infrastructure by which these methods are used is owned by an MNO. Therefore, in order for a non-MNO mobile money provider to provide these services, they require the cooperation of the network provider, which they may not be willing to provide, or may provide at high prices or at poor quality (Mazer & Rowan, 2016).
- *Agent network:* As mentioned earlier, due to the two-sided nature of the sector, agents who facilitate cash in and cash out transactions are essential for the success of the mobile money scheme. Incumbent networks that have invested significantly in the development of agent networks may sign exclusive contracts with such agents, or impose exclusivity through tacit understanding, thus restricting access of entrants to potential customers. Given the significant cost involved in setting up an agent network, it is often not feasible to set up another agent network alongside the existing one.

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- *Account interoperability:* Mobile money providers may not interoperate with other providers, or if they do, they may set lower prices for transfers within the same network (on-net) than transfers across different networks (off-net). The network externalities support the incumbent player and make it difficult for entrants to attract users.
- *Applications:* The mobile money platform has the ability to support a number of value-added services. However, mobile money providers may foreclose providers of some of these services and applications, by refusing access to application programming interfaces (APIs) that are necessary to integrate such services with the mobile money platform. MNOs' systems may be non-interoperable, or non-user friendly, except for pre-approved applications by a few chosen firms.

As the sector grows and matures, effective competition is necessary to reduce prices, improve the quality of products and services, as well as increase the diversity of the product offering (Mazer & Rowan, 2016). It is well recognised that regulatory intervention may be necessary to ensure more competitive outcomes in markets with network effects and economies of scale (Viscusi, Vernon & Harrington, 2005). Such interventions can be classified into two categories, *ex ante* regulation or *ex post* regulation. *Ex ante* regulation refers to regulation established in expectation of a possible market failure or abuse of dominance, while *ex post* regulation is enacted after the fact and following an investigation and confirmation of anticompetitive behaviour by firms. While *ex ante* regulation can protect competitive rivalry at the outset, such as by mandating interoperability, it can also reduce incentives to invest in a network, as other smaller rivals can "free ride" to an extent on the investment being made by the first mover (Bourreau & Valletti, 2015).

In the initial stages of a new service, conditions need to allow an incentive to invest, as otherwise the service does not take-off. The question is what regulation should be introduced at the beginning, and at what point greater regulation (including competition enforcement) is required to prevent abuse of the market power, which may be gained by the lead firm as it gains incumbent advantages. It is in balancing the incentives of the lead firm and its rivals, and the interests of firms and consumers, that the regulatory challenges lie (Viscusi et al., 2005).

3. Competition issues in the Ugandan mobile money market

The case study of the evolution of mobile money in Uganda raises a number of issues which we assess here, before analysing the implications for competition enforcement and regulation in more detail in the subsequent section. The competition issues which have emerged in Uganda are largely in line with the four issues identified by Sitbon (2015), as described above. In addition, potential for coordinated pricing appears to be an issue.

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Interoperability and high off-net charges

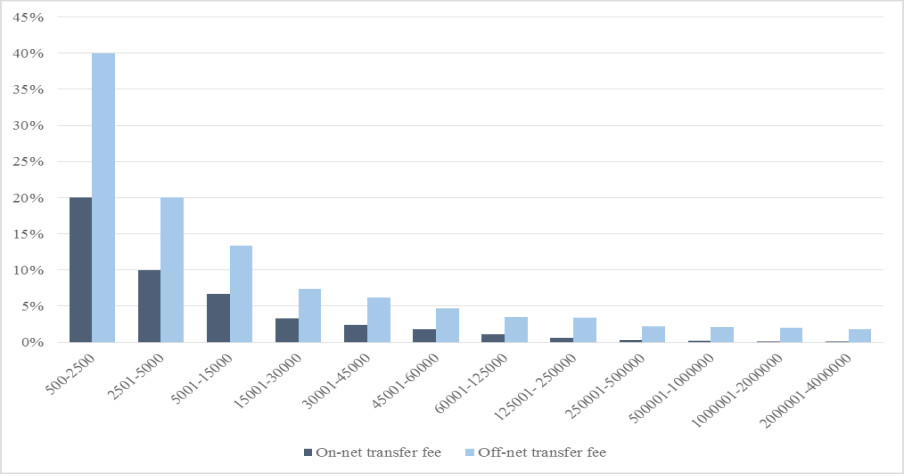
As of 2016, there is no interoperability between mobile wallets in Uganda, which makes smaller rival networks significantly less attractive than MTN Uganda. The "unregistered"/off-net person receiving the transfer must make a physical withdrawal at the sending mobile money provider's agent. The inconvenience of this generates a barrier to using mobile money providers other than those that have a large number of active subscribers, principally MTN Uganda. This is reflected in the large differences observed between subscriber numbers and usage, reflected in Table 1 and Figure 2 above.

Network effects are reinforced by the absence of mobile number portability in Uganda, which imposes switching costs on consumers and locks them into a particular telecommunications network for telecommunications services, and thus also (in the MNO-led model) mobile money services. The utility of a personal phone number may become even more valuable as mobile financial services evolve to include loans and savings, as has occurred from 2016. Accessing loans depends on a credit rating, based on calculations that take into account transaction data from customers' airtime top-ups and mobile money cash-in deposits, transfers, payments and cash-out withdrawals. The benefit of remaining on one network increases significantly, as eligibility for credit becomes inextricably linked to one's phone number.

The network effects in the absence of interoperability are reflected in pricing by MTN Uganda and Airtel Uganda. Both MTN Uganda and Airtel Uganda's prices for transfers to unregistered users are far higher than the equivalent they charge to transfer to registered users (Figure 3). For the tier UGX30,001-45,000, within which a large number of transfers fall (equivalent to around USD10), both MTN Uganda and Airtel Uganda customers must pay UGX2,800 (or around 6.2% of the upper limit of the transfer value of UGX45,000) to transfer to an unregistered user, compared with UGX1,100 (or around 2.4% of the upper limit of the transfer value of UGX45,000) to a registered user.

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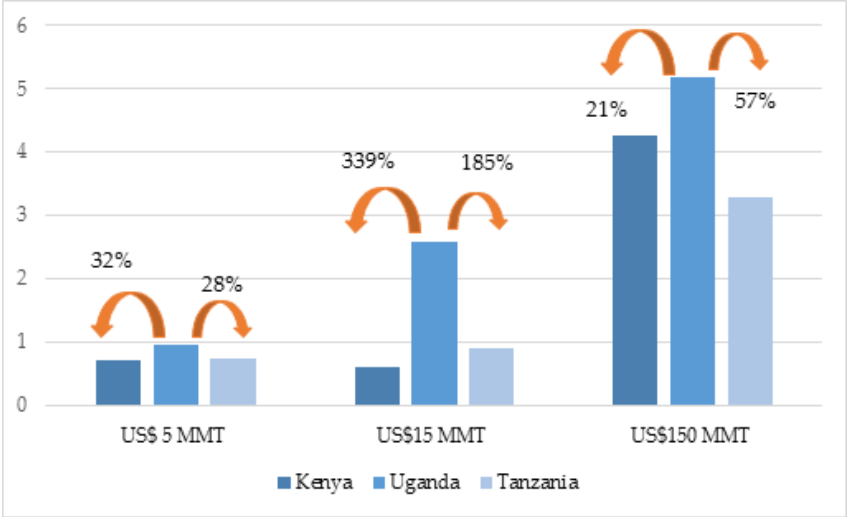
Figure 3: On-net and off-net prices for mobile money transfers, MTN Uganda and Airtel Uganda (as % of transaction value at upper limit of tiers)



Source: MTN Uganda (n.d.)

Uganda's charges for transfers to off-net or unregistered users are significantly higher than in Kenya and Tanzania (Figure 4).

Figure 4: Comparison of off-net mobile money transfer charges in 2015 for Uganda, Tanzania and Kenya, USD (largest operators in each country)



Source: MTN Uganda, Vodacom Tanzania and Safaricom Kenya websites, 2015

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Access to telecommunications network services

For other organisations, such as banks, to provide mobile money services to their existing customers, they need to be able to provide access over mobile telecommunications networks. For those customers who have smart phones, this can be done via an app such as for Internet banking. However, whereas in Uganda smartphone penetration is very low, the main way in which access can be provided is via USSD. This means that the MNOs can undermine other actual or potential rivals, via their control over USSD access.

MNOs may engage in a constructive refusal to provide access by, for example, putting in place a strict and lengthy application process for such access by non-MNOs. In at least one case, MTN was fined UGX2.3 billion (USD662,000) by a Commercial Court for anti-competitive conduct against a downstream rival, EzeeMoney (*EzeeMoney (U) Limited v. MTN Uganda Limited*, 2015). When EzeeMoney entered the mobile payments market, it contracted MTN Uganda for the provision of digital transmission, as well as 30 fixed telephone lines. EzeeMoney also contracted Yo! to provide aggregation services. According to the Court's findings, MTN Uganda subsequently cancelled its contract with EzeeMoney, citing the fact that EzeeMoney was a direct competitor to its own mobile money business. MTN Uganda then coerced Yo! to cancel its contract with EzeeMoney, or risk access to MTN Uganda's services. The Court also found that MTN Uganda compelled its agents to deny EzeeMoney services and cut off EzeeMoney's GSM point of sale (PoS) device.

The effect of MTN Uganda's refusal to provide both USSD services and access to phone lines to EzeeMoney was found to be a 79% drop in the number of transactions by EzeeMoney. EzeeMoney also needed about nine months to restore its systems, following MTN Uganda's breach of contract. The terminals that had been configured to use MTN Uganda SIM cards had to be reconfigured at significant expense to EzeeMoney. MTN Uganda's actions appear to have succeeded in foreclosing EzeeMoney out of the mobile money business, forcing the company to develop a new mode of operation.

Agent exclusivity

There were no prohibitions on agent exclusivity when mobile money was launched in Uganda. Though it is not clear whether this was an explicit regulatory decision, or simply the result of a lack of regulation, it meant in practice that MTN Uganda could roll out an extensive agent network that exclusively provided MTN Uganda mobile money services. The exclusivity was obviously beneficial to MTN Uganda and improved the business case for investing in recruiting and training mobile money agents.

Agent exclusivity was removed in 2013 with the release of the BoU's mobile money guidelines. It took several months for exclusivity to be removed in practice and

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for agents to feel safe providing services for rival mobile money providers (sector participant, personal interview, 19 January 2016). In the case brought by EzeeMoney against MTN Uganda (referenced above), one of EzeeMoney's complaints was that MTN Uganda staff physically attacked agents with EzeeMoney branding (*EzeeMoney (U) Limited v. MTN Uganda Limited*, 2015). While agent exclusivity has now been prohibited in Uganda, agents may still choose to work only with a single provider, as is the case with MTN Uganda's master agents. MTN Uganda's larger network makes this a profitable option.

Coordinated conduct

While MTN Uganda is the largest mobile money provider by a substantial margin, the second placed Airtel Uganda is significant, especially in terms of subscribers. The retail prices for on-net and off-net prices of these two players are notably very similar (Table 2 and Table 3), unlike those of the smaller players UTL and Africell Uganda. Similar prices may result from vigorous competition, but may also reflect some form of coordination or mutual understanding. Prices for the smaller players UTL and Africell Uganda are different and appear to be competitive. Africell Uganda does not, in fact, charge any fees for transfers to registered users.

Table 2: Mobile money tariffs per tier for sending money to registered users per service provider in Uganda shillings (UGX)[4]

Tiers	MTN Uganda	Airtel Uganda	UTL	Africell Uganda
500 – 2,500	500	500	450	0
2,501 - 5,000	500	500	1,000	0
5,001 – 15,000	1,000	1,000	1,000	0
15,001 - 30,000	1,000	1,000	1,000	0
30,001 – 45,000	1,100	1,100	1,000	0
45,001 – 60,000	1,100	1,100	1,000	0
60,001 – 125,000	1,400	1,400	1,000	0
125,001 – 250,000	1,400	1,400	1,000	0
250,001 – 500,000	1,400	1,400	1,000	0
500,001 – 1,000,000	2,200	2,200	2,300	0
100,0001 – 2,000,000	2,200	2,200	2,300	0
2,000,001 – 4,000,000	2,200	2,200	2,300	Not provided

Source: Operator websites

4 Tariffs are as at 17 February 2016 and were obtained from the MTN Uganda, Airtel Uganda, UTL and Africell Uganda websites.

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Table 3: Mobile money tariffs per tier for sending money to unregistered users per service provider in Uganda shillings (UGX)[5]

Tiers	MTN Uganda	Airtel Uganda	UTL	Africell Uganda
500 – 2,500	1,000	1,000	450	880
2,501 - 5,000	1,000	1,000	1,000	880
5,001 – 15,000	2,000	2,000	1,000	1,900
15,001 - 30,000	2,200	2,200	1,000	1,900
30,001 – 45,000	2,800	2,800	1,000	2,800
45,001 – 60,000	2,800	2,800	1,000	2,800
60,001 – 125,000	4,400	4,400	1,000	4,200
125,001 – 250,000	8,400	8,400	1,000	7,700
250,001 – 500,000	11,000	11,000	1,000	11,000
500,001 – 1,000,000	21,000	21,000	2,300	21,000
100,0001 – 2,000,000	40,000	40,000	2,300	38,000
2,000,001 – 4,000,000	70,500	70,500	2,300	Not provided

Source: Operator websites

4. Evolution of regulation and the impact on competition

Mobile money in Uganda initially evolved in a regulatory grey area, with no clear rules and no single regulator. The regulatory framework had to play catch-up to rapid developments in the sector, as is common in new and disruptive sectors, such as mobile money. The interesting questions are, what effect this had on the structure of the market and, in turn, on current and future competition and the implications for regulation.

The growth of mobile money benefited from initial regulatory light touch, particularly in areas such as agent exclusivity (Sitbon, 2015). The ability to roll out an exclusive agent network strengthened MTN Uganda's business case for launching the service and making the investments required, including conducting public awareness and education campaigns to encourage consumers to try the service. Though competitors who followed benefited from MTN Uganda's investment in public awareness and education, which encouraged adoption of the service, they still had to invest in replicating an agent network. Until 2013, they could not approach the most attractive agents, such as the established retailers in a given area, who had largely already signed up with MTN Uganda. Airtel Uganda seems to be the only competitor who had the resources to roll out a competing network on any significant scale. As shown in the discussion above, these two firms remain the largest networks (in terms of voice and mobile money subscribers) and entrench their advantage through differential on-net and off-net transaction fees, which reinforces network effects.

5 Tariffs are as at 17 February 2016 and were obtained from the MTN Uganda, Airtel Uganda, UTL and Africell Uganda websites.

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The initial regulatory light touch thus encouraged the introduction and growth of the new sector in Uganda. As the system grew and was adopted more broadly, a consequence of this regulatory approach was the dominance of the first mover (MTN Uganda) and second entrant (Airtel Uganda). Both these operators have built relatively large networks and can thus sustain revenue from their mobile money businesses, by encouraging existing users to remain and transact more on their networks, rather than to compete fiercely against each other for market share. Their similar pricing patterns suggest a lack of significant price competition between the two. In addition to the inherent network effects on smaller rivals and follower firms, MTN Uganda has also been found to have directly engaged in exclusionary conduct against EzeeMoney. The conduct with regard to USSD codes illustrates how the position in mobile telecommunications can be exerted to undermine rivals seeking to use telecommunications, to mount a competitive challenge in mobile money services.

Continued light touch regulation may result in an entrenched concentrated market structure, with a dominant leader in the form of MTN Uganda and a smaller follower in Airtel Uganda. This has the risk of stifling innovation by other potential rivals offering new and improved services and undermining competition in mobile money as a whole. At the same time, the incentive to invest in developing new services depends on being able to appropriate the returns. This means that MTN Uganda, and to a lesser extent Airtel Uganda, are rewarded under the current structure for investments they make. As mobile money services mature, the concerns about undermining competition from other providers increase, as the innovation and service developments come from a diverse range of providers. These providers include businesses meeting the needs of different user groups, such as those providing micro-finance to smaller farmers and aggregators looking to provider payments solutions (Blechman, 2016). The Ugandan authorities have already taken a step towards reducing barriers to smaller rivals with the removal of agent exclusivity in the Mobile Money Guidelines of 2013. Similarly, mandating interoperability would level the playing field with regard to the smaller MNOs, as long as it is accompanied by measures preventing excessive off-net differentials.

Strong regulatory measures to open up access and to encourage services competition over the established networks include regulation of the pricing of and access to USSD. Some have suggested that functional separation of mobile money services from mobile telecommunications may also be helpful. An additional challenge that remains is the lack of a credible competition enforcement regime within Uganda. The UCC has powers to investigate and fine firms for anticompetitive behaviour, but they have not used these powers to date. The UCC has commissioned and conducted a number of studies on the key markets in the telecommunication industry, including a competition study of the provision of mobile platform access to USSD (Cartesian, 2015). This assessment found that MNOs that supply access to USSD codes have the ability and incentive to limit competitive entry in retail markets for value added

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services provided over USSD channels, price access to USSD excessively and provide poor quality service with compensation (Cartesian, 2015). A basis for UCC regulatory intervention has thus been set, although no regulations have been introduced as yet. This and the UCC's non-intervention in the EzeeMoney case led to questions about how the regulator will exercise its *ex ante* and *ex post* powers.

The light touch regulation approach used in Uganda may have benefited the growth of the sector initially, but it appears that change is required to enable rivals to challenge incumbents and reap rewards from innovation. There are still significant opportunities for financial inclusion in Uganda, particularly in farming communities, where co-operative savings can facilitate access to inputs. The dominance of the incumbents and exclusion of rivals appears to limit the introduction of new and innovative products.

By way of contrast, we comment on the situation in Tanzania, which bore similarities to Uganda in the initial stages of inception. Tanzania's mobile money sector is made up of four players. In terms of number of subscribers, market shares as at September 2015 were more or less evenly distributed: Vodacom (38%), Tigo (33%), Airtel (27%), and Zantel (2%) (Roberts, Blechman & Odhiambo, 2016). However, in terms of revenue estimates, as at January 2016, Vodacom had a market share of between 53-54%, Tigo a share of about 40% and Airtel 10%. As at 2015, the service offering of mobile money providers in Tanzania was more robust, evolving beyond transfer to bill payments, mobile insurance products, merchant payment services, and mobile savings and credit (Roberts, Blechman & Odhiambo, 2016).

The sector is governed by the Bank of Tanzania (BoT), using a flexible and proactive approach. Regulation of the sector, in the beginning, was similar to Uganda, in that the central bank issued letters of no objection to banks partnering with MNOs. This system has since been replaced, following the enactment of the National Payment System Act, 2015 (NPS Act). Mobile money providers must obtain two kinds of licences: a payment licence in order to operate a payment system and an electronic money approval to issue e-money. A third licence can be acquired to enable the issuance of payment cards (Roberts, Blechman & Odhiambo, 2016). In addition to the above Act, the Payment System Licensing and Approval Regulations, 2015 and the Electronic Money Regulations, 2015 (EMR) provide other procedures and conditions for the operation of these licenses. Key requirements of these regulations include legal separation of mobile money services from telecommunications services, and the prohibition of exclusivity of the providers' agent networks.

Tanzania's mobile money sector also stands out because all four MMT services have implemented bilateral account interoperability (Roberts, Blechman & Odhiambo, 2016). Following a process of negotiation involving the BoT, the mobile money providers, two of the country's largest banks and a number of non-governmental

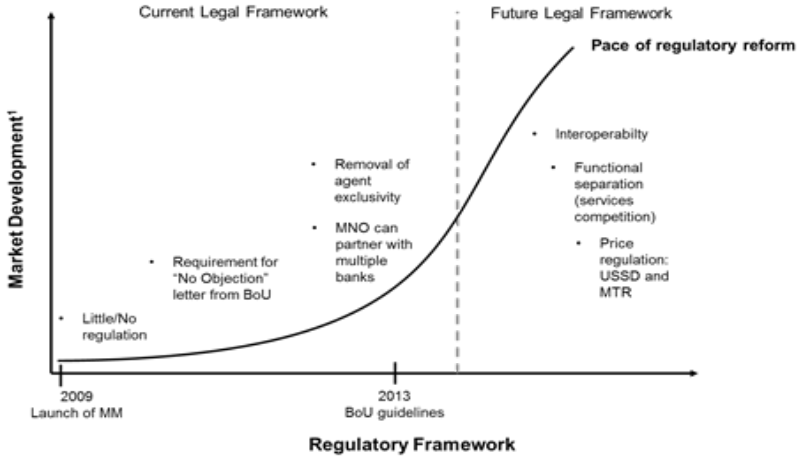
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organisations (NGOs), the providers agreed on broad parameters for interoperability. Airtel Money and Tigo Pesa were the first to achieve account interoperability in August 2015, followed by EzyPesa in February 2016 and finally by Vodacom M-Pesa.

Tanzania is a success story, comparatively speaking (Roberts, Macmillan & Lloyd, 2016). The sector experienced rapid growth in mobile money transfer, achieved openness of its market and yet maintains rivalry between the different operators, allowing for low prices and rapid innovation and the availability of a variety of services. A key factor of this success has been the flexible and facilitating regulatory framework. The sector regulation at the launch of mobile money was light touch, which facilitated the growth of the sector. However, subsequent regulation encouraged entry by removing agent exclusivity and reduced barriers to entry by facilitating interoperability between the various players.

The current concern is how to facilitate entry of new and disruptive firms, including non-MNO mobile money providers, which could increase competition and innovation, and improve quality of services, in the sector. The slow pace of regulatory evolution in Uganda, which facilitated the development and spread of the service, may actually entrench MTN's incumbency and stifle disruptive competition and innovation. Not only the pace, but also the intention of regulation, will need to change to encourage continued dynamism in the sector, as illustrated in Figure 5 below.

Figure 5: Evolution of mobile money regulatory frameworks



[1]Measured by *inter alia*(i) user acceptance, (ii) number of active users, (iii) volume of transactions, (iv) number of service

Source: Sector participant interview, 22 January 2016

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5. Conclusion

Light touch regulation has proved essential for the incentivising the growth of mobile money, as is evident in a number of countries, including Uganda, Tanzania and Kenya. However, due to the nature of the industry, rapid growth can easily result in the creation of a dominant player. High levels of concentration and the existence of a dominant player may reduce the incentive to innovate and to reduce prices. Dominant players also have an incentive to act anti-competitively to foreclose entrants. The evidence suggests that this has occurred in Uganda.

This study found that off-net charges in Uganda are very substantially higher than off-net charges in neighbouring countries Kenya and Tanzania. For a transfer of USD15, charges in Uganda were as much as 339% more than the charges in Kenya and 185% more than the charges in Tanzania. It has also highlighted anti-competitive behaviour, such as excluding rivals, evidenced in the case between MTN and EzeeMoney in Uganda.

In this context, then, regulation that is flexible, responsive and timely could encourage competition and lead to low prices and high levels of innovation, as Tanzania's experience suggests.

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Competition, Barriers to Entry and Inclusive Growth in Retail Banking: Capitec Case Study[1]

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Abstract
This case study examines barriers to entry in retail banking in South Africa, informed by Capitec's experiences as an entrant in this concentrated and highly regulated sector. Capitec's entry and growth in transactional banking sparked a competitive response from incumbents. Across all four incumbent banks, the fees for low-cost accounts have come down in nominal terms. It is unlikely that these effects would have occurred if the status quo had continued without a disruptive entrant, or if Capitec had been acquired by one of the incumbents early on. Capitec overcame barriers to entry including customers' reluctance to switch, complex regulation, and the largely self-regulated payments system, in order to grow, in a sector populated by incumbents with some market power. The case study considers measures that could lower barriers for future entrants.

Keywords
competition, barriers to entry, digital technology advances, retail banking, Capitec Bank, South Africa

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1. Introduction

This article examines a case study of a new entrant building capabilities and engaging in competitive rivalry in a concentrated market with high barriers to entry, namely retail banking in South Africa. The case study provides insights into business model innovations, including the usage of digital technologies that allowed Capitec to navigate market power and emerge as an important participant in the market, albeit one that still holds a relatively low market share. The study relied on interviews with retail banks (Capitec Bank, Mercantile Bank, Ubank); regulators and policymakers (Payment Association of South Africa (PASA), South African Reserve Bank National Payment System Department and Banking Supervision Department, National Treasury); research institutes (Solidarity Research Institute, FinMark Trust, Moody's); the Banking Association; Thutuka (payments processor); and, PSG Investment Bank (PSG). Secondary research included a review of banks' annual reports, industry reports and the Competition Commission's Banking Enquiry (Competition Commission of South Africa, 2008). The study aims to provide lessons for policymakers on how to craft the kinds of policy and regulation that promote competition and that may enable market entry.

A notable feature of Capitec's strategy is its use of digital technology to develop a low-cost banking offering that appeals to mass-market consumers. The bank built an electronic platform that removed paper transactions and simplified operations in the branch. This was a departure from the typical banking experience, which involves complex forms and processes that intimidate newly banked customers (interview with FinMark Trust, 17 June 2015). The study shows how this use of digital technology has enabled Capitec to compete against the incumbents, particularly at the lower end of the market.

It is well established that there are barriers to entry in network industries (Armstrong, 2005; Motta, 2004; Rochet & Tirole, 2003). Consumers tend to be sticky in not readily switching between providers, as a result of the associated inconveniences and "lock-in" features of network services. This implies that such industries are concentrated and firms have market power. Studies of the South African banking industry have confirmed the significantly high levels of concentration with C4 concentration ratios of over 80% (Bikker, Shaffer & Spierdijk, 2012; Simatele, 2015; Simbanegavi, Greenberg & Gwatidzo, 2014). The studies have also identified monopolistically competitive behaviour and suggested that attention needs to be paid to increasing levels of competitive rivalry. This highlights the importance of understanding, in greater detail, the nature of entry barriers and the benefits from successful entry and increased rivalry, of which Capitec is the best exemplar.

Barriers to entry in retail banking are largely a product of sunk costs, related economies of scale, regulation and the need for interoperability (Motta, 2004; O'Donoghue & Padilla, 2006). To offer a basic transaction service, which competes with at least the

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minimum product package offered by incumbents, requires IT systems, a branch and automated teller machine (ATM) network, and brand-building expenditures (Autoriteit Consument & Markt, 2014, p. 15; Dick, 2007; Office of Fair Trading, 2010, p. 63). Most of these outlays are sunk investments, which cannot be recovered in case of failure. Retail banking relies extensively on technology, and consumers have come to expect digital solutions that allow easy management of bank accounts, transparency and speedy access to services (Govender & Wu, 2013; Maduku, 2013; PwC, 2012). Product differentiation between banks is influenced by technological choices and capabilities (Competition Commission, 1998, p. 63; interview with FinMark Trust, 17 June 2015).

The intrinsic nature of the industry provides the basis for strategic activity by incumbents, to further raise obstacles to entrants, such as those related to consumer switching costs, which obstacles can increase the expenditures required on marketing and the time period over which these costs can be recouped (Church & Ware, 2000; O'Donoghue & Padilla, 2006). There are substantial entry costs associated with regulations, including the cost of obtaining a banking licence and the related authorisations; the basic cost of compliance; and the need to maintain a certain level of regulatory capital, whose type and quality is usually specified in law. Such regulations are naturally important. However, it is important to consider how regulations are designed and implemented. Entrants also need to access the national payments system and enter into bilateral and/or multilateral arrangements with established incumbents (Competition Commission of South Africa, 1998, p. 55).

The most important regulatory body for retail banking in South Africa is the Reserve Bank[2], through its Banking Supervision and National Payment Systems divisions. The South African Reserve Bank has delegated the management of the payment system to the Payment Association of South Africa (PASA). Other regulatory bodies governing retail banking include the Financial Intelligence Centre, tasked with combating money laundering and the financing of terrorism and related activities; the National Credit Regulator, which oversees lending to retail customers; and the Financial Services Board, which oversees the banks. Efforts at self-regulation are carried out under the auspices of the Banking Association, which has produced a voluntary Code of Banking that outlines the minimum standards of service that a bank must extend to its customers.[3]

2 The role of the Reserve Bank is set to change with the introduction of a new regulatory regime dubbed "twin peaks". In this new model, the prudential regulation of banks will be separated from the regulation of market conduct. The latter is likely to be performed by a unit outside the Reserve Bank whose mandate includes promoting competition in retail banking.

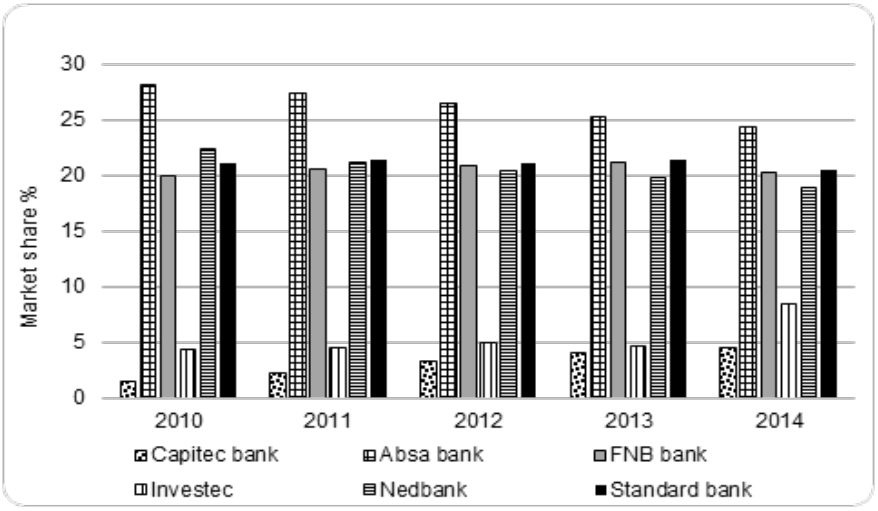
3 The Independent Communications Authority of South Africa does not have any direct role in regulating retail banks, save for their activities as mobile virtual network operators.

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2. Market power and barriers to entry in retail banking in South Africa

The retail banking sector is that part of the financial services industry that is concerned with providing transactional services (payments), credit, savings and other financial intermediation and advisory services to individual consumers and small businesses. Over 85% of the share of retail deposits is accounted for by the "big four" banks namely those that trade as Barclays Africa (ABSA), Standard Bank, First National Bank and Nedbank (Figure 1).

Figure 1: Market share of retail household deposits, 2011-2014



Source: Capitec (2014), based on South African Reserve Bank data

The issue of market power in South African retail banking has been traversed in a few studies (Alves, 2011; Competition Commission of South Africa, 2008; Hawthorne, Goga, Sihin & Robb, 2014). Notably, the Competition Commission's Banking Enquiry Panel engaged with the matter extensively in its final report. The enquiry report defined market power as "the ability of a firm to charge prices above those that would prevail under competitive conditions" (Competition Commission of South Africa, 2008, p. 34). The Banking Enquiry Panel found that, in the market for personal transactional accounts (PTAs), established banks enjoyed market power derived from various factors. Retail banking was characterised by economies of scale, which make it difficult for medium-sized businesses to compete in the market. High fixed and common costs underpin market concentration. The banks are characterised, in the report, as avoiding price competition as far as was possible, but competing on other dimensions. The Panel argued that the banks were taking advantage of various mechanisms to lock customers in to a particular banking institution. The Panel found that differentiated products and complicated pricing structures allowed

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banks to remain highly profitable. Banks' power is also aided by the costs of switching that customers incur when changing banks. The recommendations made by the Banking Enquiry Panel to improve competition in retail banking have been partly implemented, in particular the determination of interchange fees between banks by an independent party, the lowering of penalty fees for low income customers and increased transparency in banking charges (Hawthorne et al., 2014).

Banking Enquiry Panel recommendations on customer switching

The Panel recommended that the following be included in the Code of Banking Practice: standardisation of terminology; a requirement to communicate in "plain language"; the provision of minimum information on bank statements and information on charges on every account; advanced notice of new and altered charges; and a regular rights reminder (Competition Commission of South Africa, 2008, pp. 498-506). Furthermore the Panel outlined other recommendations that were meant to improve information mobility, as well as easy the switching process, including creation of generic banking profiles by the Banking Association to ease comparisons between products; establishment of a central banking fee calculator; abolishment of comparative advertising restrictions; the creation of a code of switching practice;[4] and a central Financial Intelligence Centre Act (FICA) hub to ease switching[5] (Competition Commission of South Africa, 2008, p. 500).

National Treasury (2010) issued a press statement, following engagement with the banking industry, in which it was announced that the recommendations above would be implemented, but at the discretion of the banks. The Code of Banking Practice was revised in 2012 to effect these changes. Recommendations related to easing the comparability of products were not taken forward. It was argued that the creation of generic profiles would risk collusion. Customer profiles and a centralised calculator were not implemented. Though detailed guidelines on switching have been added to the Code of Banking Practice, customers are still liable for any charges or penalties that may arise during the process.

Banking Enquiry Panel recommendations on the payments system

The structure, functioning and governance of the payments system also present a barrier to entry in retail banking. Only banks are allowed to participate in the payment system as settlement and clearing agents. The Banking Enquiry Panel made an extensive range of recommendations related to the governance of the payment system and the pricing of inter-bank arrangements. The Panel also raised concerns

4 It would include criteria on the provision of information and documentation, a schedule setting out the terms on which banks were to provide each other with documentation and in terms of which transfers were to take place. It would allow for customers to be exempt from paying fees that are due to failures in the switching process.

5 This has not been implemented because of lack of clarity about which bank bears responsibility for breaches of the law.

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about the level of price competition for ATM services. It identified two causes of market power in the provision of ATM cash dispensing services. The first was interbank pricing arrangements, which the Panel argued inhibited price competition. The second arose because only registered banks could acquire these services.

To implement the Panel's recommendations, banks agreed to: provide a detailed breakdown of fees and charges on bank statement; display a message on ATM screens where customers are to be charged an additional fee for ATM usage; and review the policy of cash back at POS - which is now offered by banks at participating retailers. The Reserve Bank is implementing a multi-phase interchange determination project, which resulted in new ATM fees being set. However, the process does not allow for public scrutiny of the methodology or input from non-banks (Hawthorne et al., 2014).

The Panel raised some concerns about barriers to entry and competition in the payments system: Banks were gatekeepers into the payments system (only banks could become members of the Payments Association of South Africa (PASA), giving them power to supervise their non-bank competitors and entrants); the path to move from a non-clearing bank to a clearing bank was not set out clearly and the process was time-consuming; innovation would have to conform to the preferences and business imperatives of clearing banks and the payment clearing house, placing potential limits on innovations by non-banks; Bankserv Africa's pricing practices could be problematic, as it is dominant and owned by the incumbent banks; only clearing banks could issue electronic money (Competition Commission of South Africa, 2008, p. 478).

To remedy this, the Panel recommended that: Non-bank providers should be allowed to participate in clearing and settlement activities in low value and retail payment streams; the membership and governance of PASA should be revised to include non-bank participants, with objective entry criteria and formal reporting to the National Payment System Department of the Reserve Bank; the creation of a Payment System Ombud to ensure fair treatment of all participations in terms of access and pricing (Competition Commission of South Africa, 2008, p. 471).

Some changes have been implemented to improve the governance of the payments system (interview with PASA, 22 July 2015). The Council of the Payments Association of South Africa (PASA) now has an independent chairperson, who is not affiliated to any bank. The representatives of the banks owe a fiduciary duty to PASA and no longer represent a mandate from the banks that employ them. Non-banks can be designated to become members of the payment system's self-regulatory body, PASA.

The partial and ongoing implementation of the Banking Enquiry Panel's

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recommendations improved the competitive environment for retail banking. Capitec executives also note that the promulgation of the National Credit Act, No. 34 of 2005 created certainty in the unsecured lending segment (interview with Capitec, 10 November 2015). This meant that lenders in the unsecured segment had clear legislation and regulations to comply with, instead of operating under an exemption from the Usury Act that could be withdrawn at any time. The exemption had also restricted lenders to loans of up to ZAR10,000 and repayment terms of up to 36 months. With the National Credit Act, these restrictions fell away. This allowed for the emergence of a clearly regulated environment, where institutions with capabilities in lending on the strength of affordability assessments could develop their businesses. With higher loan amounts and longer repayment terms, unsecured lenders were also able to capture middle class clients.

3. The Capitec case study, 2001-2015

Mode of entry into banking

Capitec registered as a bank in 2001 during the "small banks crisis",[6] which was undermining consumer and investor confidence in the sector. The crisis that unfolded from 1999 to around 2002 saw a number of small banks failing. These bank failures include Regal Treasury Bank,[7] Saambou[8] and BOE.[9] The business that became Capitec was formed through the acquisition of a number of micro-lending businesses by PSG Investment Bank. At the time, there were many individually owned micro-lending entities, many of them run by civil servants who had cashed out their pensions after the democratic transition (interview with Capitec, 10 November 2015). The personal loan market was under-developed at the time. Lending consisted mainly of secured loans, in addition to loans extended by furniture and other retailers. The PSG move was an attempt to consolidate a few players to create the platform for a retail bank. From the beginning, the aspiration was to be a mass bank covering all individuals with a regular income.

Significant acquisitions by PSG in micro-lending include SmartFin and Finaid,[10] which were bought in 1997. These acquisitions gave PSG a branch network across

6 Largely caused by the liquidity crisis of 1992 which can be traced to the South-East Asian financial crisis of 1997, the concomitant banking crisis as well as the Russian financial crisis of 1998.

7 The run on Regal Bank is said to be the result of external auditors rescinding their approval of the financial statements of the bank's controlling company in 2001. This led to an outflow of funds creating a liquidity crisis. The bank was placed under curatorship on 26 June 2001 (South African Reserve Bank, 2002).

8 Saambou's demise was due to losses in its microfinance activities. It was the seventh largest bank at the time.

9 BOE faced a run by its wholesale depositors. National Treasury guaranteed that it would fund withdrawals from the bank as a measure to restore confidence. The bank was ultimately acquired by Nedbank.

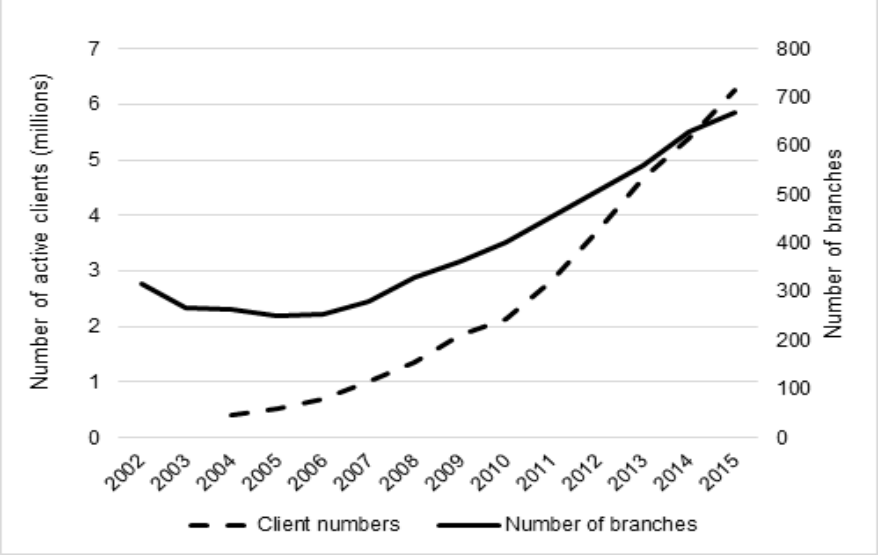
10 Finaid offered pay-day loans.

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the country. Finaid had 300 branches and only one product: 30-day loans charging 30% interest per month (Ashton, 2012). These micro-lending branches were steadily converted into banking branches, at significant cost, to form the basis of what would become Capitec Bank.

The PSG Group had two banking licences at the time of the formation of Capitec, one from The Business Bank and another for PSG Investment Bank (interview with PSG, Stellenbosch, 2015). The Business Bank's licence was transferred to Capitec Bank Holdings on March 2001. Capitec listed on the Johannesburg Stock Exchange on 18 February 2002. Though Capitec was built on a set of acquisitions in its early days, it has experienced organic growth since then. Capitec grew quite slowly initially as illustrated in Figure 2 below. The number of branches initially declined between 2003 and 2005. However, its growth in terms of branches and clients accelerated significantly from about 2008 onwards, with the number of branches increasing from 363 in 2008 to 629 in 2014, and the number of clients from 1.1 million to 5.4 million. By February 2015, Capitec had over 6.2 million active clients. This represents a 16% increase from February 2014. According to Moody's, 2.8 million of these clients deposited salaries and made payments from their Capitec account, using it as primary bank account (Moody's, 2015).

Figure 2: Capitec number of branches and clients, 2003-2014



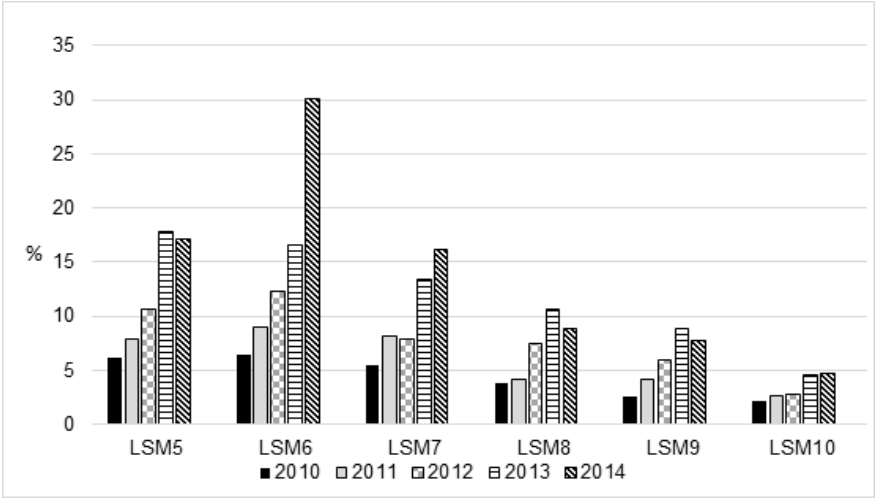
Source: Capitec (2003-2015)

Capitec's growth has been particularly strong in the low-income market. Figure 3 below illustrates Capitec's market share by living standard measure (LSM) band for

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the period 2011 to 2013. It shows that Capitec's market share grew strongly in all the bands, but particularly in LSMs 5 and 6 where, by 2013, it had 17.8% and 16.5% market share respectively. Capitec executives attribute the bank's apparent growth acceleration from 2008 to regulatory developments, funding and internal initiatives (interview with Capitec, 10 November 2015). The National Credit Act provided the legal and regulatory framework that allowed the bank to extend loan terms. As capital restraints on lending were done away with (only the interest rate limitation was left after the Usury Act was repealed), the bank's loan book grew. Regulatory certainty allowed the market to develop. Funding lines also became available and Capitec embarked on its debt-raising note programme. Finally, initiatives to improve branches, systems and people matured, which allowed the bank to increase its fee income.

Figure 3: Capitec market share by living standard measure (LSM) band



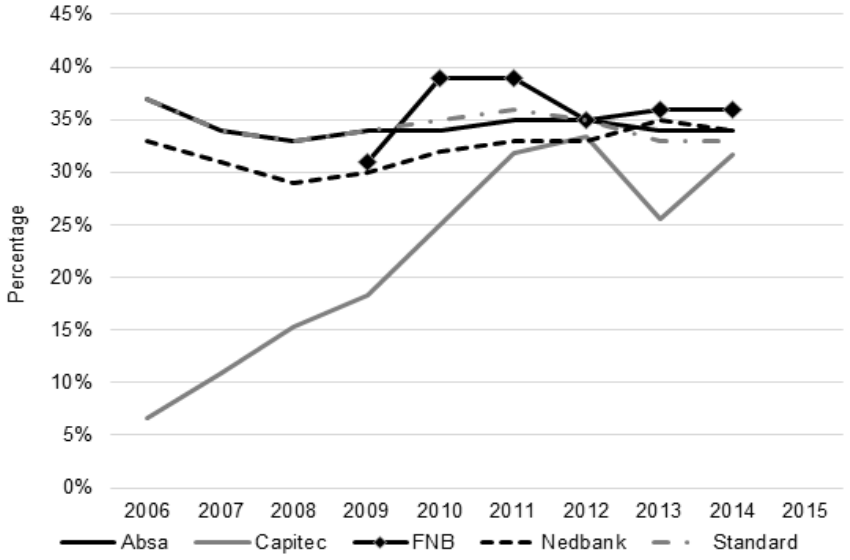
Source: Capitec (2014), based on All Media and Products Study (AMPS) data

Looking at market shares for retail household deposits, however, it is clear that although Capitec's market share has grown strongly, it is still very small compared to the four major banks, at less than 5% in 2013 (see Figure 1 above). This performance does not rule out the possibility that there may still be barriers to growth and expansion in the market. This view ties in with the findings of a recent banking enquiry review, which found that, since the banking enquiry of 2008, newer entrants have increased their share of total deposits, but the retail banking market remains relatively small (Hawthorne et al., 2014). Capitec's transactional fee income reflects

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this. As a percentage of Capitec's operating income before impairments, transactional fee income rose from 13% in 2008 to 22% in 2015, while for the big four banks, the ratio has ranged from 29% to 39% over the nine year period 2006-2015 (see Figure 4 below).

Figure 4: Net fee and commission income as a percentage of revenue before impairments



Source: Bank annual reports; Hawthorne et al. (2014)
Note: Net revenues used for ABSA, First National Bank (FNB), Nedbank and Standard Bank, gross revenues used for Capitec based on data availability. Though gross revenues are used for Capitec, its proportion of transaction fees is still lower than that of the other banks.

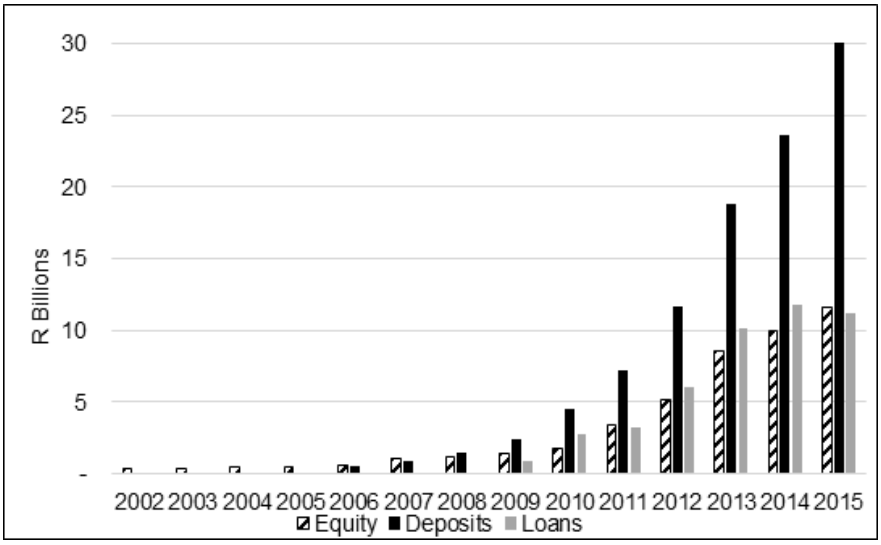
Sources of finance

Main sources of funding

Various sources of finance have been utilised by Capitec since its inception. In the early period between 2001 and 2003, the company was mainly financed by equity, which represented more than 80% of long term financing at the end of the 2003 financial year. Debt instruments were first utilised in 2004, while deposits became a significant source of finance between 2007 and 2008. The bank raised debt funding against future growth from European development finance institutions. Discussions about raising debt funding were lengthy and difficult (interview with Capitec, 10 November 2015). The remaining sources of finance utilised over time are depicted in the graph in Figure 5 below.

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Figure 5: Sources of finance, 2002-2015



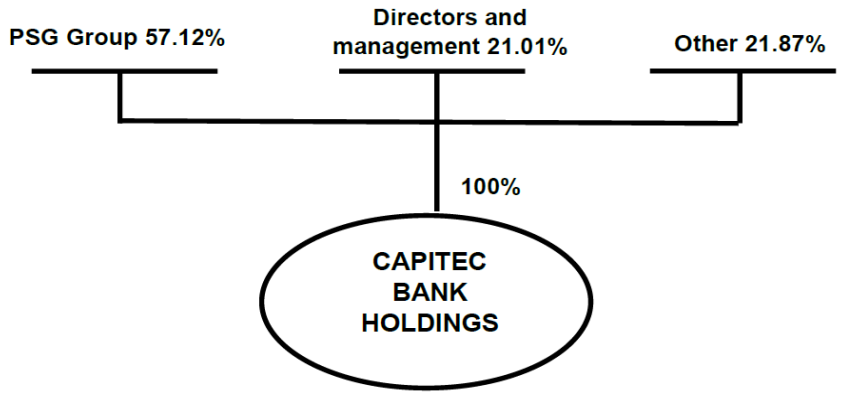
Source: Capitec (2003-2015)

Share capital and other components of equity

Financing remains one of the biggest challenges for new entrants in the banking sector. Capitec struggled to raise financing in the early years. For the greater part of the infant years, the company was self-funded and significant portions of profit were retained by the entity. The bank started off with one-month loans, in order to quickly recoup capital and make profit, so that this could be reinvested. As a result, on average, 71% of profits were reinvested into the entity between 2002 and 2007, while the highest retention rates of 100% and 99.1% were recorded in 2002 and 2004 respectively (Capitec, 2003-2008). The partnership with PSG played a pivotal role in ensuring the survival of the entity, specifically in the early days when other investors were sceptical about investing in Capitec (Figure 6).

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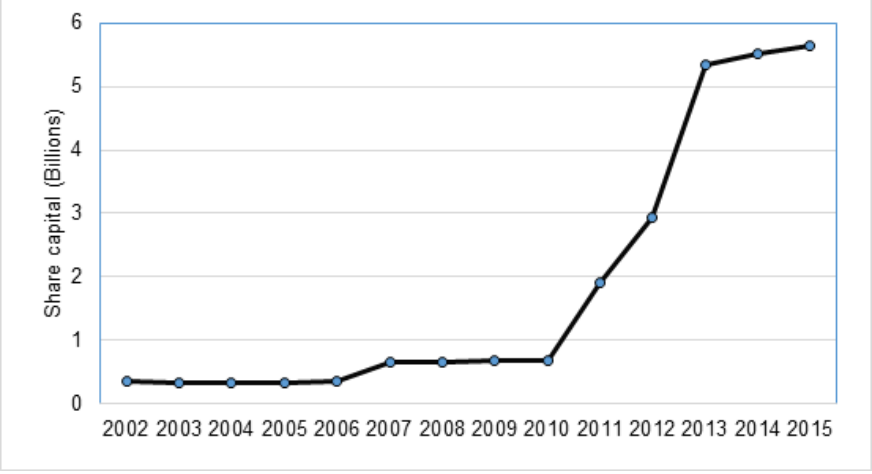
Figure 6: Capitec's shareholding as at 28 February 2003



Source: Capitec (2003)

Capitec's reputation grew over time and investors' confidence started to increase, which enabled Capitec to raise more capital. During the 2007 financial year, Capitec issued 10 million shares that increased the share capital by 86%. There were also share issuances in 2011, 2012, 2013 and 2014, which raised ZAR1.2 billion, ZAR1.007 billion, ZAR2.4 billion, ZAR136 million respectively. Figure 7 below shows the movement in Capitec's share capital over the years 2002-2015

Figure 7: Growth of Capitec's share capital 2002-2015



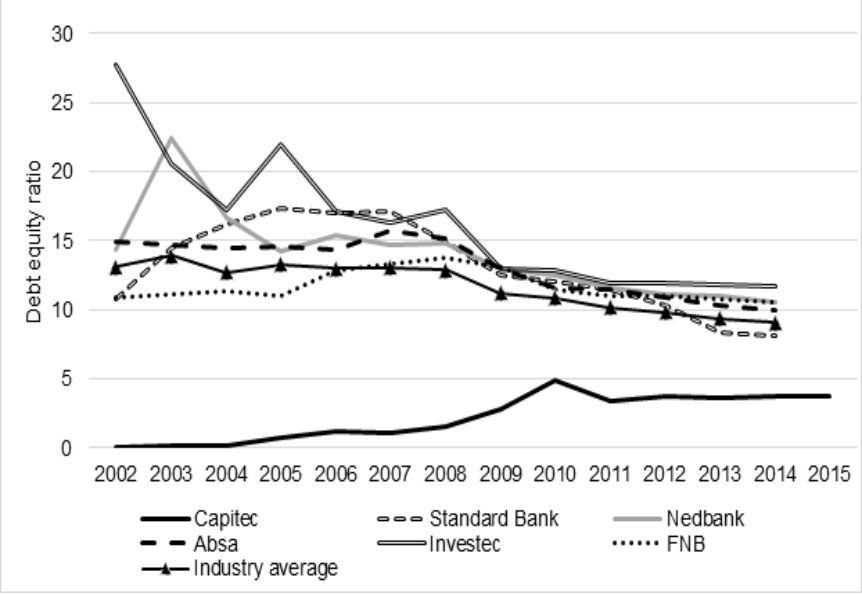
Source: Capitec (2003-2015)

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Long-term loans and deposits

Capitec Bank adopted a conservative approach towards the utilisation of debt financing. The bank first took on debt instruments in 2004. After 2007, negotiable instruments and the domestic medium term note were the two main sources of debt instruments, while subordinated and senior bonds were issued during the 2015 financial year. Despite emphasis on conservatism, Capitec also attributes the low levels of debt funding partly to the inaccessibility of debt markets for small companies. In the early years, Capitec could not issue investment grade debt instruments, because they were a small organisation with no track record, hence they were limited to specialist financiers, such as development finance organisations (interview with Capitec, 10 November 2015). Capitec's level of debt within the capital structure has improved over the years, however, it is still very low, relative to the industry average and the other five banks (Figure 8).

Figure 8: Capitec's capital structure relative to other banks



Source: Annual reports of ABSA (2003-2015), Capitec (2003-2015), FirstRand Group (2003-2015), Investec (2003-2015), Standard Bank Group (2003-2015).

Capitec's lack of access to debt financing, especially in the early years, did not only impact the ability to expand the entity's operations, but also affected the entity's profitability, as a result of a low financial leverage. The passage of the National Credit Act No. 34 of 2005 brought some relief, as the bank issued bigger loans with a term longer than 36 months, allowing for leverage.

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4. Capitec's competitive strategy

Target market and customer acquisition strategy

In line with its ambition to become a retail bank for the mass market, particularly low-income households and the unbanked, Capitec branched into deposit-taking and payments, despite its origins as a micro-lending institution. The Capitec Group describes its focus as providing "retail banking services to all individuals based on the principles of simplicity, affordability, accessibility and personal service" (Capitec, 2008). The large unbanked and "badly banked" population in South Africa presented a significant market opportunity, as, in 2004, only 45% of the population was considered to be banked (FinMark Trust, 2013).

During Capitec's early years, the banking industry introduced the Mzansi account for the unbanked. The incumbents also introduced products and services aimed at the low income/low revenue end of the market. These included FNB's roll-out of mobile branches, Pick 'n Pay's Go Banking partnership with Nedbank and Standard Bank's branchless banking. Capitec did not participate in the Mzansi initiative, but introduced its own attractive offering (interview with FinMark Trust, 17 June 2015). According to Capitec executives, the bank did not want to differentiate clients by income (interview with Capitec, 10 November 2015). They sought to establish a "single status" culture, without the stigma associated with an account for the poor. Incumbents spend a lot of time on market segmentation, and tailoring products to segment. Capitec offers simple products across all segments. This approach meant that the bank could benefit from economies of scale reaped by providing standardised products. The standardised approach also meant that the bank was able to use recent graduates and school leavers with just seven weeks of internal training.

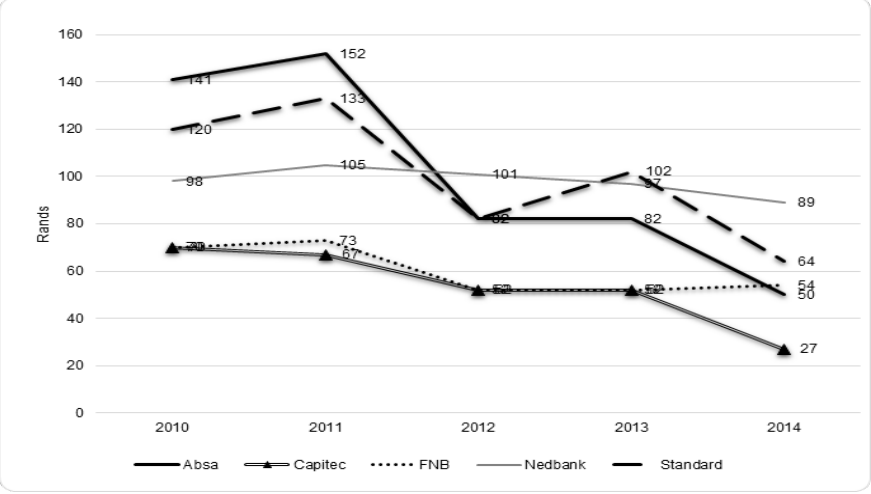
Historically, South African retail banking customers did not switch banks easily, partly because it was seen as a cumbersome process. Previously underserved, low-income customers might also trust the big four banks more than new entrants, as the former had established brands and had built credibility over time. According to FinMark Trust (2014), banking customers have been more sophisticated. In the run-up to the Finscope study, four million people switched banks (FinMark Trust, 2014). Banks have also become more transparent about charges, thus facilitating switching. Capitec has overcome some of the challenges to switching by making its prices and product structures simple and transparent. The customer's entire banking relationship is managed through the Global One account. The bank's electronic platform is built to give the customer visibility of their savings, credit and transactional history through one bank account. The bank's executives emphasised that this is key to the Capitec value proposition (interview with Capitec, 10 November 2015. This simplicity, in an opaque industry, appears to be a key competitive advantage for Capitec. In effect, it has turned barriers to switching into an advantage, because what sets it apart most from other banks is its transparency.

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Product design (low transaction fees, high rates on daily savings, low interest on loans)
In line with the "one status" culture mentioned above, the Global One account is available to all income segments. The high interest rates on positive balances are part of the affordability proposition to customers. This has not affected earnings negatively, as the bank has a low cost base (very low cost-to-income ratio by global standards) and has a high margin lending business. The main omissions in the offering are credit cards and overdrafts.

Though three of the four main incumbents did not initially see Capitec as a challenger, they have now responded with similar offerings (Capitec, 2015). These include FNB's Easy Account and Smart Unlimited and ABSA's Transact. Capitec offered the cheapest account until around 2012, see Figure 9 below. According to Solidarity Research Institute, ABSA's Transact account and FNB's Easy Account now compete strongly with Capitec (interview with Solidarity, 2 July 2015). A key element of the bank's strategy is to locate its branches in places that are convenient to the consumer, for example commuter nodes such as taxi ranks.

Figure 9: Lowest priced bank account (monthly fees)



Source: FinMark Trust (2014)

IT infrastructure and digital technology advances
Unlike its incumbent competitors, Capitec was not encumbered by a legacy IT system. Therefore, it could build custom IT infrastructure in line with current market needs. The bank could also consider newer, more advanced information technologies, as it could not afford a mainframe system. It settled on a core banking system used by banks worldwide, in particular banks in India that dealt with high volumes of

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transactions. It also relied on the Windows platform, which is a low cost and scalable approach. There was no pressure for the bank to expand into its capacity, instead, it increased its capacity as needed. On the negative side, it had to import most of its IT requirements and customising for South African conditions was difficult (interview with Capitec, 10 November 2015). Capitec acknowledged, in interviews, that the IT requirements for starting a new bank are not insignificant. A retail bank needs the system, not only to provide services to their own clients, but to connect to other banks. Systems also have to be customised for legislation.

The cost of building a new IT system was not a significant constraint on cash flow, as the bank could start small. The systems were available within a reasonable time, as their IT service providers were also minor players at the time. Now that these service providers have been acquired by larger technology companies, their systems are more expensive. The IT systems enabled Capitec to build their services around the customer. Whereas traditional banks have silos, i.e., a cheque system, a card system, other, Capitec built the various components into one core client-centric system.

Incumbent banks may have developed advanced digital platforms to cater to affluent customers. Capitec deployed its technological capabilities to serve the mass market. It built a business model based on efficient and customer-friendly branches, enabled by the utilisation of queue management systems, digital signatures, biometric and photographic identification, and the digital storage of supporting documentation, amongst other technology uses (Capitec, 2015, p. 23). This improved the customer experience and lowered the cost of servicing its market, which the incumbent banks considered to be expensive. The ease of transacting supported Capitec's efforts to convert the previously unbanked to become active users of their accounts, in contrast to the outcomes of the Mzansi initiative, which saw many accounts lying dormant (interview with FinMark Trust, 17 June 2015).

Digitally-mediated payment channels: ATM network and cash-back at point of sale

Access to cash is important to the low- and middle-income customer base that Capitec competes for. In general, an ATM network is a significant competitive feature in the market for deposit-taking. For small banks with a limited ATM network, the chances are that their customers would withdraw money from other banks' ATMs – off-us transactions – attracting interchange fees from incumbents. The Banking Enquiry found that off-us ATM charges were quite high in South Africa. The mark-up by a customer's own bank was also much higher than the interchange it pays on the transaction. For the reasons above, it was important for Capitec to roll out infrastructure for its customers to withdraw cash. Its branches did not handle cash, but customers had access to ATM machines co-located at branches. The location of Capitec's ATMs and customer's transaction behaviour (a few major withdrawals per month) will have alleviated demand for cash at rivals' ATMs.

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Another cheap way for consumers to access cash is to withdraw at retail points of sale (cash-back at till). When Capitec enabled customers to receive cash-back at tills in 2005, it was still an under-utilised service in South Africa. This was an attempt by Capitec to save on ATM costs. It was also a secure option for customers. Furthermore, the retailer benefitted as it allowed it to move cash, which is costly to manage and transfer by road. Members of Capitec's executive team were able to tap into relationships they had with retailers from their time at Distillers and at Boland Bank to effect this digital and process innovation (interview with Capitec, 10 November 2015). At the time, most banks could not process cash back transactions. Initially, Capitec had a direct line at Pick n Pay. It got an exemption from PASA to "sort at source" for cash back at point-of sale.[11] According to the Reserve Bank, this allowed the bank to continue with its business, whilst others got their house in order (interview with South African Reserve Bank, 8 October 2015). Other banks appealed this exemption. It can thus be deduced that banks used the appeals process to block innovation, or to buy time for winning back their competitiveness.

Cash-back at till transactions have not had mass take-up, with low volumes transacted. Only 4% of customers use this instrument, compared to 78% using ATMs. Capitec is of the view that fees are not the barrier to greater take-up. Cash back fees are lower than those for ATM withdrawals. The main challenge is likely to be how customers have been socialised into using ATMs for cash withdrawal. Campaigns to create awareness and encourage behavioural change could increase utilisation of this digitally-mediated payment channel (interview with Capitec, 10 November 2015).

Skills and capabilities

Though Capitec was established by an investment bank, it soon acquired executives with retail and banking experience, with key personnel having worked at Boland Bank, Board of Executors Bank and Distell. These executives had experience in banking, but also in operating in low-income communities. It is interesting to note that the banking institutions that the executives were previously involved with and other banks that had been taken over by PSG, such as The Business Bank and Real Africa Durolink, had encountered difficulty if not outright failure. Hence, the executive team came to the Capitec experience with cautionary tales that would have prepared them for building this bank. This is likely to have informed the deliberate and conservative approach to expansion and financing taken by the bank in its early days (interview with PSG, 2015). Some key IT appointments were made early on.

11 A customer who wanted cash back at the till would have their transaction processed directly to Capitec Bank, even though Pick n Pay had another bank acquiring transactions at its tills. Sorting at source allows the merchant to choose which bank they will use to complete a transaction. Hence it allows for bilateral transactions that do not have to be cleared and settled in the interbank system. If all merchants were able to sort at source, in the extreme case, there would be little need for the interbank system.

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Luck played a part too, with the shut-down of an IT division belonging to another company in Paarl, making it possible for Capitec to pick their best employees.

The take-off in branches and operations

Capitec experienced a pick-up in the number of customers around 2008. Its executives gave a number of reasons for this: The National Credit Act formalised the legal and regulatory framework to extend the terms of loans. The capital restraint fell away, with only interest rate limitations remaining. The loan book grew on the back of regulatory certainty. Funding lines became more open. The bank embarked on its note programme in 2008. Its internal initiatives on branch expansion, and systems and people development, began to pay off, leading to the growth of fee income. The bank survived the vulnerable period when it could have been bought out (interview with Capitec, 10 November 2015). However, the larger banks began to imitate Capitec's branch physical layout, advertising messages, switching service and opening hours. As Solidarity Research Institute (2010-2014) reports demonstrate, there was a heightened focus on pricing.

5. Payment system regulation and entry into banking

To offer banking products to their clients, banks have to enter into inter-bank arrangements to facilitate payments between customers across the banking sector. Payment instructions are exchanged (cleared) and then settled through Bankserv daily and the Reserve Bank's Real Time Gross Settlement system immediately. The payments system is built on the principles of process and IT interoperability and stability. Banks have to ensure that they are able to process the instruments provided by other banks and that their products also meet agreed-upon specifications. The various types of payment instruments (cheque, electronic funds transfer) are organised as payment clearing houses (PCHs). Each PCH is made up of member banks that offer that service (interview with PASA, 22 July 2015). The member banks devise the rules and modalities of the PCH, which are approved by the PASA Council. Non-compliance with PASA rules attracts financial penalties.

According to PASA, the main risks within the payment system stem from its interconnectedness, while the failure of one institution can lead to the failure of others (interview with PASA, 22 July 2015). The settlement system represents the biggest concentration of risk. It is common for this area to be reserved for banks, as the banking regulator can enforce collateral requirements against them. Any non-bank wanting to operate in this field should become a bank, PASA argues, as this would be an easy way to monitor collateral and capital adequacy. Non-banks could enter as "designated" member, exempt from banking licence. In this way, they can participate in clearing, but not settlement.

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Capitec's experience in entering and participating in the payments system

According to Capitec (interview with Capitec, 10 November 2015), entry into the payments system was not difficult. In line with PASA's rules, Capitec found a mentor bank to ease it into the various payment clearing houses. ABSA performed that role. The fees that are charged for these arrangements are likely to be high by international standards (interview with PASA, 22 July 2015). Sponsorship fees are based on values and volumes. There are no guidelines for sponsorship and mentoring arrangements. In PASA's view, entrants can shop around for the best arrangement and PASA was not aware of a situation where a new entrant has not been able to secure a sponsor. PASA was not aware of any rejections to requests to join the body. However, PASA has no direct influence over negotiations between mentors and mentee banks.

As a new bank unburdened by legacy systems, Capitec was able to introduce new ways of doing business, like moving away from fax notification for EFT disputes. Capitec was the first to issue a debit MasterCard (as opposed to a Maestro card), which came with a transaction processing methodology[12] that was typically used for credit card transactions. Initially, some banks did not process the messaging properly. Capitec had to wait for the other banks to develop the capability to process payments from the card. To move unilaterally would have meant a poor customer experience for those holding the card, as it would be declined at merchants who use card acceptance facilities provided by the incumbent banks. This meant a significant delay in roll-out of the Mastercard offering (interview with Capitec, 10 November 2015).

To introduce a new financial instrument depends on the pace of the slowest acquirer. The Banking Enquiry Panel Report argued that introducing innovation is beset by two main challenges: (i) gaining permission from the incumbent to introduce the development in a payment clearing house, and (ii) negotiating inter-bank fees. The report argues that innovation could meet resistance from incumbents who feel threatened and may expose the innovator's intellectual property. When it was put to PASA that new developments may be thwarted in this way, the Association countered that this is no longer a significant issue. Furthermore, PASA imposes penalties for breaches of its rules on interoperability.

A note on other entry episodes into retail banking

Capitec entered the retail banking market largely through internal financing. Since 2008, Capitec has grown into one of the top six banks in the country, however, this is a relatively unique success story in South Africa. Other small banks and recent entrants show a contrast with Capitec's experiences.

12 A dual messaging system. In a single messaging system, authorisation of the transaction and clearing occur simultaneously for each transaction, but in a dual system, clearing is done in batches.

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Ubank, formerly known as Teba Bank, was established to provide financial services to mineworkers in the 1960s, through facilitating the distribution of salaries to the mines, before becoming a deposit-taking institution in the 1980s. In an attempt to develop a customer base outside the mining industry, it rebranded itself as Ubank in 2010. It could be argued that Ubank should have been the front-runner in banking the low-income, unbanked market, given its decades of experience in providing basic banking services to mineworkers and running a remittance system between mining and "labour-sending" areas. Yet, its forays into the general population have not been successful to date, largely as a result of lack of financing.

The bank does not have a "shareholder of reference" as it is owned by a trust, whose beneficiaries are miners represented by the majority trade union, currently the National Union of Mineworkers, and the Chamber of Mines. Its Tier I capital comprises solely of retained earnings and it has no debt on its balance sheet. The bank has engaged a range of investors with limited success and it faces a challenge in accessing debt, as it does not have a credit rating. Ubank's struggle with raising Tier 1 capital is not unique, as other small banks such as Ithala, Sasfin and the former Abil also experienced problems, reliant mostly on bonds. Without a significant capital injection and a revitalised business strategy (which Ubank claims to have, but which is hampered by lack of capital), it is difficult to see Ubank emerging as a competitive force to challenge the big four and Capitec.

Mercantile Bank is another small bank, which has been operating in South Africa for 50 years. It started out as the Bank of Lisbon, with a focus on the Portuguese-South African consumer market. In 1996 it became known as Mercantile Lisbon Bank, after a merger with Mercantile, a non-banking financial institution. In 2005, the bank changed its name to Mercantile Bank. After a period of weak performance, the bank was restructured, with a new core focus on commercial and business banking. It still relied on cheap deposits from retail clients, which were lent out into segments such as commercial property. Currently the bank focuses on attracting entrepreneurs to its bank, a segment it believes is badly served by the banking industry.

As a wholly owned subsidiary, Mercantile's experience with access to finance is largely determined by the standing of its Portuguese parent, which does not enjoy a robust credit rating. The key area of difficulty identified by Mercantile is the cost of compliance with regulatory changes. Some of these changes are justified, but prove to be a disproportionate burden on smaller banks. PASA penalties also hit small banks harder than larger banks, as they are imposed as flat rates (not turn-over based). From the bank's comments, it appears that a more rigorous evaluation of the costs versus benefits of new regulation is needed.

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6. Analytical highlights

The benefits of entry

Capitec's entry and growth in transactional banking sparked a competitive response from incumbents, especially FNB and ABSA. These banks now offer products that are positioned to compete with Capitec's simple, information technology-driven and digitally-mediated, low cost offering. Across all four incumbent banks, the fees for low-cost accounts have come down in nominal terms. It is unlikely that these effects would have occurred if the status quo had continued without a disruptive entrant, or if Capitec had been acquired by one of the incumbents early on. Capitec introduced disruptive effects at the technology innovation layer and at the service layer.

The positive effects of Capitec's entry are expressed in three ways: (i) new-to-banking customers that now have access to finance, (ii) lower bank charges for customers who switch from the incumbents to Capitec and (iii) lower prices from incumbents' clients as their banks react to Capitec. This can be illustrated by the simple exercise below that shows the "savings" the latter two effects are likely to have had in the market.

Table 1: Lower prices for clients at incumbent banks

Bank	Clients 2014	Price decrease (2010-2014)	Savings
ABSA	8,600,000	ZAR91.00	ZAR782,600,000
FNB	7,600,000	ZAR16.00	ZAR121,600,000
Nedbank	6,700,000	ZAR9.00	ZAR60,300,000
Standard Bank	10,400,000	ZAR56.00	ZAR582,400,000
Total Savings (monthly)			**ZAR1,546,900,000**
Total Savings (annual)			**ZAR18,562,800,000**

Source: BusinessTech (2015) (number of clients); Solidarity Research Institute (2010-2014)

If, in 2014, customers on the lowest cost accounts at incumbent banks had been charged the same prices as in 2010, they would have paid ZAR1.55 billion more per month.[13]

13 This is not, strictly speaking, the actual savings by customers as the client base in 2014 includes new to banking customers attracted by lower prices.

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Table 2: Lower prices for clients who switched from incumbents to Capitec

Bank	Average price - lowest cost account (2010 -2014)	Weighted market share	Weighted average price
ABSA	ZAR101.40	29%	ZAR29.41
Standard Bank	ZAR100.20	24%	ZAR24.05
Nedbank	ZAR98	22%	ZAR21.56
FNB	ZAR60.20	24%	ZAR14.45
		Weighted average price – big four banks (2010-2014)	**ZAR89.46**
		Average Capitec price 2010-2014	ZAR53.60
		Difference	ZAR35.86
		Number of clients who switched (assumed 75% of new Capitec clients)	2,449,500
		Monthly savings for clients who switched	**ZAR87,843,969**
		Annual savings for clients who switched	**ZAR1,054,127,628**

Source: Using data from Table 1 above

Customers who switched from any of the big four banks to Capitec between 2010 and 2014 would have paid, on average, ZAR35.86 less per month in banking charges upon joining Capitec. This gives total savings of ZAR87.8 million per month or ZAR1.05 billion for the year 2014. This is an estimate, as some clients would have switched from a more expensive account, not necessarily the cheapest alternative of any of the big four banks. The figures are also distorted by the presence of multi-banked clients. For the two groups of beneficiaries (switchers to Capitec and those enjoying price decreases at incumbent banks), this brings estimated annual savings in 2014, compared to 2010, to ZAR19.6 billion. This figure is driven by the fall in bank charges at the big four banks. While this is an estimate, it indicates the order of magnitude of the benefits accruing to mass market consumers from a more competitive retail banking market. The presence and behaviour of Capitec does not fully account for why banking charges fell since 2010, but is a significant factor in increasing competitive intensity in the mass market.

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Table 3: Total savings[14]

Category of savers	Annual amount saved
Clients at incumbent banks	ZAR18,562,800,000
Clients that switched to Capitec	ZAR1,054,127,628
Total annual savings	**ZAR19,616,927,628**

The exception that proves the rule?

In some ways, Capitec's experience is exceptional. In an interview with Moody's (2015), the rating agency's analysts could not think of a similar bank anywhere in the world. It has surged ahead of early attempts to bank the excluded, such as Ubank (former Teba Bank) and the Mzansi initiative. Its early financial backer chose to go into banking, precisely because of the high barriers to entry in that sector. Capitec overcame customers' reluctance to switch, a key barrier to entry in retail banking, by developing a simple product that is easily understood. It also worked deliberately to convert its lending clients into transactional service clients. Some of the bank's executives, having banking experience, were familiar with the payments system. However, it is clear that the ability of a small, nimble bank to introduce changes in this environment is subject to the incumbents' willingness to change, as well as a rapid pace of change. This is a consequence of digital technology and process interoperability.

Capitec a beneficiary of regulatory changes in the industry

The competitive environment for Capitec was enhanced by regulatory and policy changes that sought to make the playing field more open and more level. The Banking Enquiry Panel Report focused attention on retail banking and heightened awareness about competitive behaviour in the sector. The partial and ongoing implementation of its recommendations improved the competitive environment for Capitec. The bank's executives also emphasised the formalisation of the National Credit Act as a measure that created certainty in the unsecured lending segment, allowing the bank to operate effectively in that space. The regulatory regime governing retail banking supports the adoption of a wide range of digital technology. However, in the payments sphere, the self-regulatory mechanism may slow down the pace of technology adoption. As mentioned earlier, payment instruments are most valuable to the customer if they have universal acceptance. Yet, there is little in the regulatory environment that encourages laggards to adopt or adapt to innovations introduced by disruptors.

14 Though Capitec would not be drawn on a specific figure, it indicated that in recent times, the profile of its clients has changed. With more mid-market customers, it is likely that the majority of its new clients were previously banked. However, even if only 50% of new clients were previously banked, the overall savings for banking clients would come down from ZAR19.6 billion (calculated at 75%) to ZAR19.26 billion per year.

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7. Conclusion: Going forward

The Capitec case study analysed here confirms the significance of entry barriers identified in the literature. The duration required for Capitec to build its business, to the point where it was able to challenge incumbents, highlights the magnitude of these barriers. From its establishment in 2002, it grew slowly, mainly due to limited funding and a narrow branch network (although this is likely to be less so for future entrants given technology changes). The experience of other small banks, like UBank, further reinforced the significance of access to finance and regulatory challenges, which have limited UBank's growth since 1994. The article also highlighted the benefits of entry and the resultant competition in the retail banking sector.

The study demonstrates that Capitec's entry into the industry resulted in significantly lower bank charges, which are conservatively estimated at annual client savings of ZAR19.6 billion in 2014. Furthermore Capitec's entry also sparked competition in low cost bank accounts, a development that resulted in established banks offering products that mimicked Capitec's Global One account. This facilitated better services for the low-income clients and enhanced financial inclusion.

However, there are certain areas that can still be improved to facilitate entry and the proliferation of small banks. One of these key areas is the switching process. This could be could be improved by instituting a regulated process with mandatory timelines, as suggested by the Banking Enquiry Panel 2008. The incoming ISO 20022 messaging standard makes provision for automated debit order and incoming (salary) payment switching. With the system having better information on debit order originators, switching will become easier. The South African Reserve Bank should consider a process where consumers are not liable for interest, penalty fees and other charges incurred due to delays in switching bank accounts (Hawthorne et al., 2014). The sharing of FICA information, with clear guidelines on where liability lies in the case of contraventions (the original or second bank), would also ease switching.

A stricter process to ensure that participants adopt and facilitate innovation, in particular further digital innovation, new instruments and other changes is called for. Regulators can play an active role in facilitating innovation. In the UK, the Financial Conduct Authority (FCA) has an innovation hub. The support offered to new and established, regulated and unregulated financial business includes: a dedicated support team; help to innovator businesses to understand the regulatory framework and how it applies to them; assistance in preparing and making an application for authorisation; and a dedicated contact person for a year after an innovator is authorised to conduct business (FCA, 2015). Potential innovators bring ideas to the regulator, not necessarily complete applications, and also their concerns about how the current regulatory framework limits them.

Capitec had aspirations to become a fully-fledged bank, but digital technology and

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business model innovations have expanded the range of institutions that can offer transactional banking services. A tiered banking licensing regime could facilitate other modes of entry in the future. Both the National Treasury and the Reserve Bank support the development of a tiered banking licensing and regulatory regime.

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Opportunities for Universal Telecommunication Access in Rural Communities: A Case Study of 15 Rural Villages in Nigeria's Kwara State

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Abstract
The goal of universal telecommunication access is to make telecommunication infrastructure available to everyone irrespective of their geographical location, income level, age, gender or other discriminatory parameters. Despite substantial efforts to close the digital divide, developing countries still encounter daunting challenges in making access truly universal. In this article, the authors report on an exploratory field survey of 15 rural communities in Nigeria's Kwara State to document their perception of the effects of rural telecoms access on their livelihoods. Results revealed mostly positive effects in respect of economic growth, poverty alleviation, health education, primary healthcare delivery, and reporting of epidemic outbreaks such as the recent Ebola crisis. However, little impact on quality of government service was recorded, as awareness of participation in governance and socio-political issues was found to be very low. The article discusses some areas in which universal telecommunications access can be expected, going forward, to address the needs of communities in rural and remote communities.

Keywords
universal access, rural telecommunications, Kwara State, Nigeria

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1. Introduction

Universal telecommunication access refers to the provision of telecommunication infrastructure in a geographical location such that people living in that area can communicate with people in other parts of the world (NTIA, 2014; Schorr, 2004). The goal of universal access is to bring telecommunication infrastructure close to everyone irrespective of their geographical location, income level, age, gender or other discriminatory parameters. Despite the potential benefits the rural areas could experience through telecommunication access, the research conducted in this study shows a continuing "digital divide" in 2015. This term is used for information inequality, for gaps in information, or knowledge, or computer and media literacy (Van Dijk, 2006). Generally, digital divide refers to the gap between those who have and those who do not have access to new forms of information technology (Gunkel, 2003). However, in this article we refer to digital divide as telecommunication access inequality within developing countries. Kilpeläinen and Seppänen (2014) argue that ICT offers an important opportunity to create and maintain communality in remote areas, and it would help to ease the hardships of everyday life, while Erdiaw-Kwasie and Alam (2016), Park (2016), and Salemink, Strijker and Bosworth (2015) discuss digital inequalities and social exclusion. The concept of closeness is defined by availability, affordability and reliability (Xavier, 2006). While rural access has proven to be a daunting challenge in most developing countries, substantial progress has been made globally over the last decade in achieving universal telecommunication access.

In this article, survey data is reported for 15 rural communities in Kwara State, Nigeria. A few areas in which universal telecommunication access can be expected to impact such rural and remote communities, is then discussed. The sectors (education, health, poverty alleviation and gender equality) considered here are selected based on the specific goals itemised in the United Nations sustainable development goals (SDGs) (United Nations, 2016) and are considered key to national development. While it may be relatively easy to appreciate the impact of ICTs on these sectors in urban centres, the challenges of poverty, illiteracy, rural-urban migration and geographical remoteness make it difficult to understand the effect of telecommunication access in rural areas. This is because ICT impact is negligible in the daily lives of most rural dwellers. However, an assessment of rural telecoms access can provide objective information on the feasibility and importance of universal telecommunication access for rural communities in Nigeria.

2. Telecommunications development in Nigeria

Telecommunications development in Nigeria can be divided into two main eras: colonial and post-colonial eras. Nigeria had a slow start during the colonial era, with the 1955-1962 Development Plan being the first serious attempt to plan public telecommunication services. Although progress slowed during the Civil War of 1967-1970, a giant leap was taken in 2001 with the introduction of the Global System for Mobile Communications (GSM) services.

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Telecommunications development in the 1990s

In 1992, the Nigerian government initiated partial liberalisation and market reform of the telecoms sector. However, Nigerian Telecommunications Limited (NITEL) held a monopoly over basic telecoms services until the mid-1990s. Decree 75 of 1992 established the Nigerian Communications Commission (NCC) as the regulator for the telecoms sector and NCC became operational in 1993. As the independent regulatory authority for the telecoms sector, NCC's objectives were to create an enabling regulatory environment for the sector, facilitate the market entry of telecoms operators, promote fair competition and efficient market conduct and establish the Universal Service Fund (USF) to promote "the widespread availability and usage of network services and applications services" throughout Nigeria (NCC, 2016a).

By 1995, 42 licences had been issued for various services, including consumer premises equipment (CPE), payphones, DOMSAT links, cellular telephony, local community telephones, value-added services and cabling (Ajayi, Salawu & Raji, 1996). By 1997, 28 companies were licensed by NCC to provide various forms of telecoms services, though NITEL still remained the only national carrier (Sadiq, Oyelade & Ukachukwu, 2011). However, the then military government's intervention with NCC regulation, coupled with policy inconsistencies, meant that growth was slow.

The new civilian government of 1999 opted for full reform of the telecoms industry in order to eliminate misuse of monopoly power by NITEL, improve services, increase sector efficiency via competition, encourage innovation and extend services to underserved and unserved areas of the country. The reform started with the cancellation of all operating licences issued by NCC, as most of the 34 licences had been issued to friends and colleagues who did not need them, thus leading to more licences than available spectrum. In December 1999, a new National Telecommunications Policy was unveiled, which formed the blueprint for full liberalisation of the telecoms market (Sadiq et al., 2011).

Telecommunications development in the new millennium

Based on the new National Telecoms Policy published in September 2000, which included *universal telecoms access and services*, the Nigerian government encouraged foreign investment and inflow of capital and equipment through elimination of restrictions on the levels of foreign equity participation and reduction in the levels of import duties on telecoms equipment from 25% to 5% in August 2001, for two years (Sadiq et al., 2011). This facilitated the introduction of several telecoms services and licences, which included fixed telephony, cellular mobile telephony, long distance transmission, global mobile personal communication services (GMPCS), international data access, high speed data transmission, value added services, Internet service, and unified access service licences (UASL). The UASL technology takes advantage of technology convergence, thus enabling licence holders to offer a variety of services, such as voice, data and ISP, among others.

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In 2001, licences were granted to three digital GSM operators: MTN, EWL and MTEL. Some fixed wireless operators (e.g., Intercellular) were also licensed. The incumbent operator, NITEL, was licensed as the only national carrier. An attempt to privatise NITEL failed and in 2002, Nigeria's telecommunications industry enthusiastically welcomed the licensing of Globacom Ltd as the second national operator to compete with NITEL (Adediran, Usman & Onyedike, 2005). The licence was awarded by NCC at a cost of USD200 million, thus yielding huge revenue to the Federal Government. Globacom launched its mobile service in August 2003. Also in 2003, the Nigerian Communications Act (NCA) repealed the NCC Act of 1992 and re-established the independence of NCC with increased regulatory power (Oniyedibe, 2004). The Act also sought to advance a new spectrum plan for Nigeria (Adediran et al., 2005).

Currently, Nigeria has a relatively high rate of telecommunications development, with an estimated 153 million subscribers for all forms of telephony in October 2016, almost exclusively mobile telephony, with only 124,812 fixed wired lines (NCC, 2016b) relative to its population size of 182 million (NPC, 2016). Kwara State has an estimated population of 2,3 million (NPC, 2016). There are nine active, licensed telecommunication operators, with services provided via GSM, code division multiple access (CDMA) (NCC 2016c), fixed wireless, fixed wired and Voice over Internet Protocol (VoIP) technologies; and 37 active, licensed Internet service providers (NCC, 2016d). Internet penetration stands at 46% (Internet Live Stats, 2016). The contribution of telecommunication services to gross domestic product (GDP) was estimated at 8.5% in 2015 and 9.8% at June 2016 (NCC, 2016e).

3. Characteristics of rural communities in Nigeria

Nigeria's population was estimated at 182 million and its GDP at USD481 billion in 2015 (World Bank, 2015). Rural communities in Nigeria are mostly characterised as living in extreme poverty, with: up to 80% living below the poverty line; lack of, or limited, social services and infrastructure, such as potable water, primary healthcare and road network; the majority being resource poor with no land assets and very limited employment opportunities; even distribution across the country, rather than being concentrated in specific geographical areas; unequal capabilities due to education and health status; and high levels of inequality resulting from unequal access to income opportunities and basic infrastructures (Ogwumike & Ozughalu, 2016; Olaniyan & Bankole, 2005; Omonona, 2009; Rowe, 2003; Zhang et al., 2016). Nigeria's rural population was estimated at 53% of the total population in 2014 (World Bank, 2016a). Table 1 depicts a few of the areas of deprivation in the rural communities in Nigeria. Of particular interest is information deprivation whereby the rural community may not have access to sources of information such as newspapers, radio, television, or telephones.

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Table 1: Measurement of deprivation

Deprivation	Mild deprivation	Moderate deprivation	Severe deprivation	Extreme deprivation
Food	Bland diet of poor nutritional value	Hungry on occasion	Malnutrition	Starvation
Safe drinking water	Lack of water on occasion due to shortage of money	No access to water in dwelling, but commercial piped water available within 200 metres of dwelling or less than 15 minutes' walk away	Long walk to water source = more than 200 metres away or more than 15 minutes' walk. Unsafe drinking water	No access to water
Health	Occasional lack of access to medical care due to insufficient money	Inadequate medical care	No immunisation against disease. Only limited non-professional medical care available when sick	No medical care
Shelter	Dwelling in poor repair. More than one person per room	Few facilities in dwelling. Structural problems. More than three people per room	No facilities in house. Non-permanent structure, no privacy, no flooring, more than five people per room	Roofless i.e., no shelter
Education	Inadequate teaching due to lack of resources	Unable to attend secondary but able attend primary education	Child is seven or older and has received no primary or secondary education	Prevented from learning due to persecution and prejudice
Information	Cannot afford newspapers or books	No television but can afford radio	No access to radio, television, books or newspapers	Prevented from gaining access to information
Basic social services	Health and education facilities available but occasionally of low standard	Inadequate health and education facilities e.g., less than one hour's travel	Limited health and education facilities e.g., a day's travel away	No access to health or education services

Source: Adapted from Olaniyan and Bankole (2005)

Figures 1 and 2 below show images of surveyed villages 2, 4 and 5, in photographs taken during the field survey of 2015.

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Figure 1: Villages 2 and 5





Figure 2: Village 4, and access road to the village





Criteria for definition of rural areas in Nigeria

Criteria that various authors have used to differentiate between "rural" and "urban" areas include size, population density, population composition, closeness to nature, occupation, culture, social interaction, social stratification, social mobility, social control, levels and standard of living. In Nigeria, a rural area is classified on the basis of population criteria, as defined by the National Bureau of Statistics and the 2006 census put the ceiling population at 20,000 (NPC & ORC Macro, 2004, p. 211). The International Fund for Agricultural Development (IFAD) considers rural people to constitute about 72% of the people living in extreme poverty, that is, on less than USD1.25 per day (IFAD, 2014), most of whom reside in low income and low-middle income countries (Adisa, 2012). Since the 1980s, the poverty levels in Nigeria have risen, increasing from 17.7 million poor in 1980 to 69 million in 2004 (Omonona, 2009), while the poverty profiles show that Nigerian poverty is predominantly a rural phenomenon. The national poverty headcount ratio in 2009 was 46% (World Bank, 2015).

4. Universal telecommunications access

In defining universal telecommunication access, the main consideration is access to service, but the term "service" remains a bone of contention in the telecommunication industry. Universal telecommunication access is characterised by service level,

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which describes the level of adoption and penetration of telecommunication services in different countries (Noll & Wallsten, 2006). At a basic level, the objective of universal telecommunications access is to bring telephony (as a minimum service) within the reach of every individual. This includes the provision of public telephone booths to provide access to individuals who cannot afford private telephone lines (fixed or wireless) in their homes. The provision of telephone lines in every home is defined as universal service (Xavier, 2006).

The adoption of mobile telephone technologies in most developing countries has helped in improving the level of penetration in these regions. However, due to technological advancements in information and communication technologies (ICTs), it is important to define universal access based on the degree of technological advancement of the services provided. While telecommunications infrastructure provides a basic platform for the provision of most ICTs, some services require broadband access, which is not readily available. The scope of universal access goes beyond the provision of telephone access and can only be properly defined in terms of access to ICTs and online multimedia content (ECOWAS, 2007). In addition to availability, affordability and reliability, access is further expanded to mean acquisition of relevant skills to make use of ICT.

In Nigeria, as in most sub-Saharan countries, the greatest challenge for universal telecommunications access has been in the provision of access to low-income households in urban centres and rural settlements (Malecki, 2003; Noll & Wallsten, 2000). While the major challenge in urban centres is affordability and accessibility, challenges in rural communities are as much about availability as affordability (Adediran, Opadiji, Faruk & Bello, 2014). Lack of availability is caused by the geographical remoteness of many communities, the scattered nature of the settlements and the terrain and vegetation of these areas (IFAD, 2014; Omonona, 2009; Opata, 2013; Rowe, 2003). Despite these challenges, the level of telecommunication penetration has increased in the past two decades, due largely to the deregulation of the telecommunication sector, the adoption of mobile communications technology and the increasing affordability of smartphones and other devices for Internet access. Growth in mobile telephony has extended to rural communities, with a substantial population of rural dwellers now integrated with the rest of the nation through mobile communications.

Universal telecommunications access models

A key issue to be considered for universal telecommunications access, particularly in rural communities, is the choice of an appropriate approach to achieve efficient and effective access. The approaches, referred to here as universal access models, depend on many factors that involve cooperation of all stakeholders i.e., service providers, governments at all levels, and benefitting communities. Universal access requires attention to the appropriate choice of access model and to the appropriate choice of

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technology. Among the factors to be considered with respect to each stakeholder group when choosing a universal access model are the following (Stern, Townsend & Monedero, 2006):

- Service provider: Level of competition; commercial profitability; tariff packages to increase ownership by local people; marketing strategy e.g., Internet, road show, radio jingles, e-mail;
- Government: Capacity to organise and run a fair and open competition; funding options; identification of actual needs and socio-economic goals of the community; recognition of ICT as a poverty reduction mechanism; level of demand for access; monitoring of performance and quality of service (QoS); unavailability and unreliability of power supply from utility companies;
- Community benefit: Knowledge of business and technical skills with respect to the technology to be adopted; end-use preferences for mode of access e.g., teleshop versus operator's booth, mobile or fixed, etc.

The following international approaches have been identified: administrative universal service obligation (USO) designation; village phone programmes; public and community Internet access model, including telecentres and cybercafés; rural cooperatives model; regional or rural operator licensing model; and community and municipal broadband model (Stern et al., 2006). Many of these models were found to be effective in developing countries, though the success of the models is dependent on context. The administrative universal service obligation (USO) designation model was experimented with in Australia between 2001 and 2004, where the incumbent operator, Telstra, retained the obligation, but allowed other companies to offer or compete to undertake USOs and receive subsidies in specific areas. This model was not successfully implemented in developing countries, as the procedure has to be objective, transparent and non-discriminatory, all of which are difficult to achieve in such an environment.

An initiative that recorded success due to business model viability was the village phone concept, begun in rural Bangladesh in 1997, in which village women were empowered financially to develop sustainable income-generating activities (Richardson, Ramirez & Haq, 2000). This has been replicated in countries including Nigeria, Uganda and Rwanda. Telecentre models have been run successfully in many developed and developing countries, for example Uganda. However, some of the challenges of telecentre growth in developing countries arise from difficulty in gaining sufficient high speed, quality and timely access to a communication circuit, and lack of quality business management and technical skills among the locals to identify and understand user demand and run a centre successfully. The rural cooperatives model can provide communication services in some rural and remote areas, particularly where a nation's carriers are not interested because of lack of profitability.

A regional or rural operator licensing model emerged in Latin America in the mid-

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1990s as an offspring of the first generation universal access service funds, which used very small aperture terminal (VSAT) satellite or fixed wireless technology, whereby operators are part of the VSAT subsidiary or rural telecommunications equipment vendors (Stern et al., 2006). Outside Latin America, the model was adopted in South Africa for rural areas with less than 5% teledensity, while each licensed operator was given ZAR5 million on licensing. The regional or rural operator-licensing model was designed with a fixed-line market in mind and later faced the challenge of encroachment of cellular operators. In addition, the operating and maintenance costs of VSAT outweighed revenues, thus making the rural operator model commercially unviable. Venezuela later introduced the concept without a minimum subsidy auction and offered a wider range of services, including fixed access, long distance and international, mobile and multimedia services. The lesson to be learnt from the Venezuelan experience is that there is a market for rural and regional operators if the appropriate business model can be found. The community and municipal broadband network model involves technologies that are not too technically demanding (e.g., Wi-Fi, VoIP) with free and open-access software. It is used in developed countries to bring broadband connectivity to rural and remote communities.

It is noteworthy that all these models require enabling policy frameworks and bridging the persistent gaps of infrastructure (connectivity), local ICT service, regulations, funding, industry, technical skills to adapt and maintain information infrastructure and system, thereby empowering change and innovation and setting policy frameworks (Hanna, 2016).

5. State of telecommunication access in rural communities: Exploratory survey in Kwara State

The results of an exploratory survey on the state of telecommunication access in rural communities in Nigeria are discussed below. The section includes the perceptions of rural villagers of the effects of mobile communications access on their welfare. Kwara State (longitude 4° 36' 25"E, latitude 8° 25' 55"N) is located in the North Central part of Nigeria with ethnic groups comprising Yoruba (majority), Nupe, Bariba and Hausa (minority) (NgEX, 2015). The state has 16 LGAs with a total coverage area of 36,825 km^2 and a population of 2,591,555 (2005 census) (Wikipedia, n.d.). Agriculture (farming) is the main economic activity. Figure 3 shows a map of Nigeria, with Kwara State in the West.

The study area comprises 15 villages across four local government areas (LGAs) of Kwara State, namely Asa, Ilorin-East, Ilorin-West and Mooro. Figure 4 shows the locations of the villages. These villages were chosen because they fell within the categories of the definition of rural areas provided by the National Population Commission (NPC & ORC Macro, 2004, p. 211). The villages surveyed have numbers of houses ranging from 10 to 40, with an average of 5 persons per home, and the

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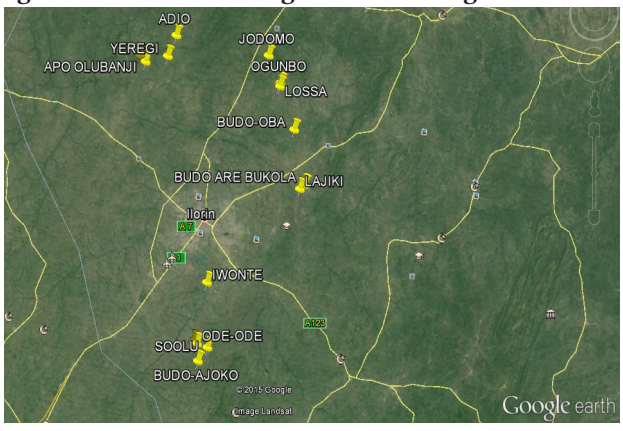
survey included persons 16 years and above. Figure 5 shows an abandoned NITEL office photographed during the field survey.

Figure 3: Location of Kwara State in Nigeria



Source: Jaymz Height-Field, Wikimedia Commons
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Figure 4: Location of villages visited during the field survey



Source: Adapted from Google Earth

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Figure 5: Abandoned NITEL office



Source: Authors' field survey, 2015

Methods of data collection

Data collection methods involved a community and an individual survey questionnaire. Interviews were conducted with each village head, for each of the 15 villages visited. The questionnaire sought to derive data about the level of telephone service coverage, access to electricity, availability of schools and other basic ICT services, such as a computer centre, Internet café, call centre and viewing centre. An individual survey questionnaire was administered to a sample of persons above the age of 16 years in the targeted villages. The subjects were selected based on convenience sampling. The visits were scheduled for Saturdays, for the convenience of both researchers and respondents. Researchers arrived at the village early, before the respondents would leave for their farms, as a large number of these rural dwellers engage in farming. The rural communities and the sample populations were selected using convenience sampling. Valid data were elicited from a total of 465 male and female respondents. The questionnaire was administered by researchers with the help of research assistants who had been well tutored on the subject of the survey. A breakdown of the number of respondents per village and the corresponding local government area is presented in Table 2.

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Table 2: Surveyed rural communities and numbers of valid responses

Village ID	Community name	Local government area	No. of valid responses
VL1	Adejimi	Mooro	24
VL2	Adio	Mooro	36
VL3	Apo Olubaji	Mooro	34
VL4	Budo-Are Bukola	Ilorin-East	31
VL5	Budo Ijako	Asa	29
VL6	Budo-Oba	Mooro	30
VL7	Iwonte	Ilorin-West	13
VL8	Jodomo	Mooro	14
VL9	Lajiki	Ilorin-East	45
VL10	Lossa	Mooro	21
VL11	Odo-Ode	Asa	38
VL12	Ogunbo	Mooro	58
VL13	Sakamo	Asa	22
VL14	Sholu	Asa	30
VL15	Yeregi	Mooro	40
			Total: 465

The survey yielded 489 responses, of which 465 were valid, representing about 94% valid responses. Of the valid responses, almost 65% (300 responses) were male respondents, while 35.48% (165 responses) were female respondents. About 62% (N=287) of the respondents had no formal education or had primary school level education only. For those that pursued education beyond primary level, only 31% of achieved some secondary level schooling.

Rural communities and universal access

Table 3 provides a summary of field survey locations based on access to telephone service, electricity, road network, education and basic ICT. Out of the 15 villages visited, 11 villages have limited access to a cellular mobile telephone service and such service is of poor quality. It was noted by respondents that they would have to climb trees or onto the roofs of their houses to make a voice call, due to poor signal reception. The remaining four villages, with total population of about 350 people, do not have access to any telephone services. Nine of the villages are connected to electricity, but electricity supply is occasional; five villages are not connected to the electricity grid; and one village, although connected to the national grid, has no electricity supply. None of the roads to the villages is easily accessible, despite the closeness (< 3 km) of some villages to the LGA headquarters. Twelve villages have at least a primary school, while three villages do not have access to schools. In terms of basic ICT access, no ICT facilities such as a computer centre, Internet café, call centre or TV viewing centre could be found in any of the villages.

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Table 3: Summary of field survey conditions and access to ICT

Village ID	Houses/ Population	Telephony operator	Electricity supply	Road condition/ Distance to LG headquarters	Year of telecommunication service inception	School types/ Number	Access to ICT			
							A	B	C	D
VL1	10/40	1	*Not connected	Not accessible/ 48 km	2000	NIL	N	N	N	N
VL2	17/120	1	*Not connected	Not accessible/ >24 km	2002	Primary/1	N	N	N	N
VL3	14/60	1	*Not connected	Not accessible/ >80 km	2002	Primary/1	N	N	N	N
VL4	16/48	1	Connected/ Occasional	Not accessible/ <6 km	2002	Primary & Secondary/1	N	N	N	N
VL5	21/60	>3	Connected/ Occasional	Not accessible/ 3 km	2010	Primary /1	N	N	N	N
VL6	25/150	0	Connected/ Occasional	Not accessible/ >40 km	NIL	Primary/1	N	N	N	N
VL7	10/50	1	Not connected	Not accessible/ 15 km	2005	Primary /1	N	N	N	N
VL8	10/24	0*	Not connected	Not accessible/ 15 km	NIL	NIL	N	N	N	N
VL9	22/70	1	Connected/ No supply	Not accessible/ <5 km	>5 years	Primary & Secondary/1	N	N	N	N
VL10	15/50	0*	Connected/ Occasional	Not accessible/ 10 km	NIL	NIL	N	N	N	N
VL11	18/50	>2	Connected/ Occasional	Not accessible/ <3 km	2002	Public School/1	N	N	N	N
VL12	25/150	0	Connected/ Occasional	Not accessible/ >40 km	NIL	Primary & Secondary/1	N	N	N	N
VL13	16/48	>2	Connected/ Occasional	Not accessible/ 6 km	2002	Primary /1	N	N	N	N

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VL14	40/190	2	Connected/ Occasional	Not accessible/ 6 km	2004	Primary /1	N	N	N	N
VL15	30/100	>2	Connected/ Occasional	Not accessible/ 48 km	2002	Primary/1	N	N	N	N

Notes:

A=Computer Centre; B=Internet Café; C=Call Centre; D=TV Viewing Centre; N=No; Y=YES

**Received signal from neighboring BTS from other towns*

+Pay-Per-Charge Electricity Supply (₦ 50 to charge mobile phone)

The mean sample per community is 31 with a standard deviation of 11.8 from minimum and maximum values of 13 and 58 respectively.

Perceptions of respondents of the effects of rural telecoms access

Responses were elicited on the extent of mobile phone ownership. About 77% of respondents (N=360), said they had at least one mobile handset. Of those with mobile phones, about 65% (N=236) possess a regular phone, while the remaining 35% have some form of smart phone. A brief discussion with some of the respondents, however, showed that the phones were acquired more for status conferral than for functional purposes.

The team collected data on the respondents' perceptions of the effect of rural telecoms access as it relates to, among other issues, health, education, security, business opportunity, and quality of government services. The researchers sought to record the perception of respondents on how the introduction of telecommunication services has affected them individually, or at the household level. The survey was interested not only in the use of the service in the rural location, but also the use of telecommunication in general. The data indicated that respondents perceived eight of the nine dimensions examined as improving. Support from family members, relationships with friends and neighbourhood security are the dimensions with the highest percentage of improvement (77% to 90%). Education, health and economic advancement are also included in the dimensions perceived as improving. This data provides some limited insight into the effects of life advancement through telecommunications services in rural communities. Only one dimension, quality of government service, is reported as declining. This may be connected with lack of awareness, as well as the low literacy status of rural dwellers. The responses are presented in Table 4 below.

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Table 4: Perceptions of telecoms access effects

Dimensions	Perceptions of the services					
	Worse		Better		Same	
	N	%	N	%	N	%
Family members' health	9	1.90	283	60.87	173	37.20
Health/medical communication	54	11.40	257	55.15	156	33.55
Children's education opportunities	3	0.66	323	69.46	139	29.89
Personal level of education	6	1.29	326	70.10	132	28.39
Neighborhood security	18	3.87	359	77.20	83	17.85
Household income	53	11.40	256	55.05	156	33.55
Support from family members	3	0.66	370	79.56	92	19.78
Relationships with friends	12	1.86	420	90.32	33	7.10
Quality of government service	254	54.62	119	25.59	92	19.78
Business opportunity	64	13.76	250	53.76	151	32.47

6. Considerations for increasing the impact of universal telecommunication access in rural communities

The United Nations has initiated 17 aspirational global Sustainable Development Goals (SDGs), with 169 targets across the 17 SDGs (UN, 2016). The discussion that follows examines how improving rural telecommunication access can be expected to contribute to achievement of elements certain SDGs, e.g., SDG1 ("No poverty"),SDG3 ("Good health and well-being"), SDG4 ("Quality education"), SDG5 ("Gender equality"), and SDG10 ("Reduced inequalities").

Impact on rural education

While education is important for national development, rural communities in Nigeria have been greatly disadvantaged in this respect with an adult literacy level of just 49% compared with the 74% in urban Nigeria (National Bureau of Statistics, 2010). The digital divide between rural and urban dwellers has aggravated an already bad situation. While it could be said that an increase in the digital divide is widening the literacy gap between rural and urban communities, it is important to note that an increase in the level of literacy in rural communities (promoted by telecommunications access) can lead to a reduction in the digital divide (Calvo, 2012). There-

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fore, implementing universal telecommunication access in Nigeria can be expected to impact rural education positively, not only by increasing the literacy level in rural communities, but also by helping to bridge the digital divide by giving rural dwellers the opportunity to access skills necessary for them to take advantage of ICTs. Ultimately, it would be advantageous to introduce e-libraries, where students can gain access to free online resources and where highly motivated rural dwellers can take the opportunity to enrol for various online certificate programmes offered by Nigerian universities (Nkanu & Okon, 2010).

Universal telecommunication access also has an impact on the current drive of government to provide education for nomadic communities (Ajidagba, Yusuf, & Olumorin, 2014; Na'Allah, 2014), who are located mostly in rural and remote areas. The deployment of mobile access points could enable access to information by nomadic teachers. Furthermore, informal education in rural communities could be enhanced through the use of mobile devices. Although education challenges cannot be totally overcome by simply providing more and better ICT devices and access or connectivity (World Bank, 2016b), educational policymakers and planners have faced persistent challenges related to the adoption of many of the products, services and usage models in remote, low-income communities around the world. In summary, implementation of universal telecommunication access in rural communities in Nigeria can impact on rural education development by providing ICT-enabled libraries and information centres and access to content for basic and post-basic education, enhancing the delivery of nomadic education and facilitating skills development among artisans.

Impact on rural community healthcare service delivery

Issues relating to the provision of community healthcare services in rural Nigeria with respect to the sustainable development goals (SDGs) include reduction of infant and maternal mortality, eradication of tropical diseases and epidemics such as malaria, cholera and polio, and combating of the spread of HIV/AIDS and other sexually transmitted infections (STIs) (United Nations, 2016). Achievement of these goals will be dependent on factors such as availability and competence of health workers, availability and reliability of health infrastructure, health education in rural communities, affordability of health services. Implementation of universal telecommunication access schemes in rural communities in Nigeria will go a long way to impact healthcare service delivery by providing access to information for healthcare workers and communities. Furthermore, universal telecommunication access will reduce information latency in healthcare delivery that often leads to unwanted outcomes like delayed response to emergencies and, in extreme cases, fatalities (Hoffman et al., 2010; Grameen Foundation, 2011; Faruk, Oloyode, Bello, & Popoola, forthcoming;).

Through the provision of rural telecommunication infrastructure, a hierarchical database for rural healthcare information management could be developed and integrated into the national health insurance system, thereby reducing the cost of ware-

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housing information in all the rural communities. Another way in which universal telecommunication access could impact the provision of healthcare infrastructure is in the management of a flexible patient transportation scheme using ICT-enabled health emergency vehicles that are on call among sparsely populated rural communities situated in relative proximity to each other, while rural communities that are closer to urban areas would be able to make use of emergency vehicles in cases where patients are to be transported to secondary or tertiary healthcare facilities.

One of the greatest challenges facing rural healthcare delivery, in Nigeria and developing countries alike, is the lack of credible real-time data on the health challenges in various rural settlements. Part of the problem is the remoteness of some of these communities, a number of which are not accessible by road and, in some extreme cases, have no waterways, as they are located deep in the rain forests, such as villages in South Eastern and Southern Nigeria. As a result, only estimates of healthcare planning parameters are derived for such areas. One way to plan for rural healthcare needs would be to implement a mobile health initiative for data transfer from rural healthcare centres to central healthcare planning offices in urban centres. Mobile health (m-health) initiatives have been gaining momentum and could be deployed for disease outbreak alerts, health education and remote access to patient registration documents (WHO, 2011). These mobile-driven initiatives were unveiled in some developing countries: mobile phone SMS in antiretroviral treatment in Kenya (Lester et al., 2010); AIDS patient care using mobile phones in Uganda (Chang et al., 2008); health workers text-message reminders to malaria treatment in Kenya (Zurovac et al., 2011); rural health centres, communities and malaria case detection mobile systems in Zambia (Kamanga, Moono, Stresman, Mharakurwa, & Shiff, 2010); remote clinics for laboratory results via SMS in Swaziland (Jian et al., 2012) and many other projects reported. These types of initiatives can only be deployed if universal telecommunication access is in place in rural communities.

Management of epidemic outbreaks is another area in which universal telecommunication access can impact rural healthcare delivery. During epidemic outbreaks, movement of people across borders of villages and towns is discouraged and, as a result, information on the situation in areas affected by the epidemic is greatly hampered where there is no means of electronic communication. Rural communities with telecommunication access have the advantage of providing information on the state of health of their populations during an epidemic outbreak are able to get information on how to manage the health crisis with minimal risk to neighbouring communities. Recently, various communication tools were used to fight the Ebola outbreak in West Africa. Ebola-related messages were disseminated on social media (COSMIC, 2016). The government of Nigeria and UNICEF used the SMS-based community dialogue platform "U report" (USAID, 2014) to reach out to people as a means to curtail the spread of the disease. In Uganda, UNICEF supported Uganda's National Task Force on Ebola to operationalise an mhealth platform, "mTrac", which enables

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real time alerts and surveillance via SMS from communities and health workers. Similarly, Senegal partnered with major mobile phone operators to send four million SMSs to the general public warning of the dangers of Ebola and how to prevent it (USAID, 2014). However, difficulties still arose due to lack of access to mobile communications and Internet across rural Africa. As the disease spread to remote locations across countries in West Africa, those people most at risk became the ones most difficult to reach, though in Nigeria the conventional communication methods such as radio and television were used to reach out to people in rural locations.

Impact on economic development and poverty alleviation: Agriculture and finance

Rural communities in Nigeria are largely agrarian societies who live mainly on the proceeds from farm produce. Other forms of economic activities, like trading and services, are localised and are small compared with the agricultural sector. One of the greatest challenges to the development of agriculture in rural communities is the limited access to agricultural extension services, including planning, education, service delivery and market control policies. In the area of planning, the deployment of Internet services in rural communities could provide agriculture extension workers with access to geological and climatic information for a particular rural community that will aid them in determining efficient distribution of farm inputs such as fertilisers, pesticides and herbicides.

Most rural communities in Nigeria have specific market days. Universal telecommunication access would facilitate an efficient flow of information between producers and consumers. This would have the effect of reducing transportation overheads, thereby making the price of goods more competitive in these rural communities. Traders would be able to estimate the quantity of their products that would sell in the markets by establishing contact with their customers via telephone and SMS, including daily updates on the price of commodities. There are over 770 million farmers in Africa and over 119 million in Nigeria (VC4A, 2014). The Agric Mobile Phone Xchange (AMPX) provides a platform that connects farmers with buyers through SMS (VC4A, 2014). This project aims to reduce rural poverty by 50% by increasing rural farmers' output by 65%, connecting 50 million Nigerian farmers and 400 million farmers across Africa by 2025. In rural Nigeria, 95.7% perceived ICT could enable them to take decisions for the sale of their products (Usman, Adeboye, Oluyole, & Ajijola, 2012). More advanced applications for food and agriculture include applications referred to as the Internet of Agricultural Things (AIoT) (Liu et al., 2016). Universal rural telecommunications access is a necessary foundation for these applications.

With respect to the financial sector, the provision of universal rural telecommunication access could promote business activities by giving the rural population access to bank accounts. In addition to this, transfer of funds could be made easier between rural farmers and customers in the urban areas.

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Impact on gender equality and development of women

Gender equality and the development of women are major thrusts of socio-political policies. Women in rural communities are worst hit by centuries of neglect due to socio-cultural practices that put them at a disadvantage in terms of economic empowerment and social justice. In order to stem the tide of further degradation suffered by women, a number of policies have been put in place by governments, assisted by non-profit organisations. These policies aim to increase of women's access to information, improvement in the rate of girl-child education, and provision for women to seek redress when discriminated against. However, the policies have limited effect. Universal telecommunication access would provide rural women with access to counselling hotlines and the opportunity to link up with legal aid groups that can fight for them in cases of domestic abuse and gender-based violence.

Sensitisation of rural communities in Nigeria about the need to improve on the current level of enrolment of girl children in schools can be facilitated by universal telecommunication access. Provision of telecommunication devices to children in some rural communities in Nigeria has already given a boost to enrolment in basic schooling. The introduction of "opon imo", a learning tablet that contains electronic copies of books required by pupils in schools in the Osun State of Nigeria, has greatly reduced the financial burdens on parents. This has led to more parents being willing to release their children to go to school, which, in turn, affects the enrolment level of girls in basic schools. It is important to provide telecommunication connectivity that will give these pupils greater access to information about the world outside their communities.

Economic empowerment of women is another area in which rural communities could benefit from universal telecommunication access. Women would be able to advertise their goods easily by taking pictures and displaying them in online marketplaces, assisted by local women's cooperative societies, reducing the overhead cost of marketing their products and increasing the visibility of their goods. Rural women would be able to establish their own contacts with customers, using rural telephone access or simple text messages, as well as to secure raw materials needed for the manufacture of their products, without having to travel.

Impact on community participation in governance and socio-political issues

While democracy is a generally accepted system of governance in the world today, it has not yielded expected dividends in many developing nations. One of the major challenges is the level of participation of the general population in the political process. For countries like Nigeria, where a substantial percentage of the population lives in rural areas, the outcome of the democratic process is shaped largely by urban dwellers. Most rural communities have little or no access to information on governance. Their participation in the political process is largely engineered from urban centres and access to their representatives in government is not guaranteed. It has

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therefore become increasingly difficult to put their agenda on the front burner of the nation's political process and their visibility to the outside world is virtually non-existent.

The aforementioned problems could be tackled using universal telecommunication access. Rural communities that are in geographical proximity to each other could mobilise their populations to bring their agenda to the fore. Individuals in these communities could have access to their representatives in government via universal telecommunication access. Furthermore, participation of the rural populace in the democratic process could be enhanced by ensuring that information on governance reaches rural communities. With universal telecommunication access, rural dwellers would be able to make their voices heard around the world, thereby gaining the attention of their own governments.

7. Conclusion

In this article, a review of the distribution of the telecommunications infrastructure in Nigeria shows their neglect in the rural communities studied, while the digital divide between urban and rural areas needs to be reduced. One way to do this is to improve the areas of application of ICT in rural areas by building on current levels of mobile communications access towards universal access to telecommunications services applied to education, healthcare, agriculture and finance, amongst other applications. The investigation of the effects of telecommunication access on rural communities in Nigeria revealed mostly positive effects in the area of economic growth, community infrastructure development, healthcare service delivery and increase in socio-political awareness and participation. However, telecoms access is not yet universal. Universal rural telecommunication access is needed to impact on community healthcare service delivery, primary healthcare delivery, reporting of epidemic outbreaks, rural economic development and poverty alleviation through adequate telecommunication infrastructure for agricultural and financial services sectors, and to impact on gender equality and women development, as well as rural participation in governance and socio-political issues.

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China and Africa: Alternative Telecommunication Policies and Practices

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Abstract
The Beijing Consensus is said to be a win-win for China and Africa. China has become a major force in global telecommunications markets, as a manufacturer, a content provider and in delivering services to its citizens. While the relationship between China and Africa has been explored in many areas, telecommunications has been ignored, despite its strong domestic performance, as well as the presence of Chinese equipment in African networks and in the hands of consumers. China has not exported its domestic model of competing state-owned operators, nor have those operators followed the "going out" strategy. However, manufacturers have benefitted from the Washington Consensus model of oligopolistic markets. In countries with higher risks, they have been aided by Chinese development banks and intergovernmental agreements. In a new policy model, for the Comoros and Ethiopia, Chinese firms have taken on outsourcing of network functions for the state-owned operators. Additionally, manufacturers have found several channels to supply feature-phones and smartphones at low prices, helping to widen access. Absent from African markets are the providers of Internet content and apps. There is very little evidence of spillover effects, with little knowledge being transferred. China has won from hardware sales in Africa, while Africans have won wider access to telecommunications, including states rejecting the Washington Consensus model.

Keywords
Africa, China, Internet, policy, regulation, telecommunications

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1. Introduction

The support of Mao Zedong and the Communist Party of China (CPC) for anti-colonial movements in Africa was, after a long gap, replaced by the Beijing Consensus, a model of development said to offer mutual benefits, in contrast to the Washington Consensus, preferred and promoted by the international financial institutions (IFIs), with its allegedly exploitative neoliberal ideology (Kennedy, 2010; McKinnon, 2010; Williamson, 2012).[1] China has become the largest trade partner and the largest developing country investor in Africa, in addition to providing financial and technical assistance (Busse, Erdogan & Mühlen, 2016). The recent shift in the Chinese economy has seen a steep fall in demand for physical resources, as it moves to higher value-added activities. The responses to the economic and policy changes in China have lacked clear and coherent strategies from African governments, suggesting they are not taking full advantage of the potential opportunities. The business and economic engagements between China and Africa have been and continue to be examined in detail; the extraction of gas, oil and ores to supply Chinese manufacturers, the farms that feed its population (Bräutigam, 2015), and the import of Chinese manufactures into Africa (Alden, Large, & Soares de Oliveira, 2008; Manji & Marks, 2007; Wang & Elliot, 2014). This article addresses an area previously ignored, that of the telecommunications sector, in which China has become a significant presence, in policies, in the provision of infrastructure, in the sale of manufactures and, thus, in the everyday lives of Africans.

Global best practice in telecommunications policy, as advocated and supported by the IFIs, aims for limited, oligopolistic competition by a complex mix of financialisation, liberalisation, privatisation, and regulation (Blackman & Srivastava, 2011; Intven, Oliver & Sepulveda, 2000). Network operators must obtain government licences, either alone or with international or local partners. Manufacturers then sell equipment to the licensed operators and to their customers, with volumes dependent on growth of the market and thus on politico-regulatory decision-making, notably on levels of competition. Consequently, there is intensive corporate political activity (CPA) by manufacturers and operators in the elaboration and adaptation of policies at global, continental, regional, national, provincial and municipal levels (Sutherland, 2014).

Telecommunications has been recognised as an infrastructure enabling and generating economic development and growth (Röller & Waverman, 2001; Waverman, Meschi & Fuss, 2005). Networks widen markets, improve information flows, lower transaction costs and substitute for physical transport. They also provide a platform for economic or Schumpeterian disruption, notably through the "Überisation" of established markets (Nurvala, 2015).

The development of telecommunications in Africa is invariably presented as a pos-

1 This non-interference model is being supplemented by the Asian Infrastructure Investment Bank (AIIB, 2016).

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itive story (Etzo & Collender, 2010), though it is largely alien, with governments adopting policies developed by the countries of the Organisation for Economic Co-operation and Development (OECD), usually without much formal adaptation or customisation to national circumstances. The resulting markets are dominated by Arab, European and Indian operator groups, supplied with equipment from manufacturers in China, Europe and North America. Commercial practices have proved so successful, that they have spilled over from competitive and well-governed markets, into countries that do not or could not follow the best practice model, including (i) micro-states and small island developing states (SIDS), with weak institutions and without economies of scale; (ii) conflict and post-conflict states, where good governance was unavoidably absent; and (iii) countries without liberalisation or competition.

China is a major source for Africa, both of network equipment for operators and of phones and smartphones for consumers, with their low unit costs greatly improving affordability. Its network equipment manufacturers have, where there are heightened political risks, been supported by intergovernmental agreements and by loans from development banks. Manufacturers of handsets have engaged on purely commercial terms, proving flexible in their use of formal and informal distribution channels. However, Chinese operators are entirely absent, a difference that cannot be coincidental. Nonetheless, some networks have been constructed and a few subsequently run by other Chinese firms. Countries that would not implement the global best practice reforms have benefitted from the greater flexibility of the Beijing Consensus, and are thus meeting demand for services and boosting their economic growth.

Africa cannot be treated as a single entity, rather it should be disaggregated, to consider countries that are small and large, coastal and landlocked, peaceful and in conflict, democratic and autocratic, rich and poor in resources (Mohan, 2013b). Similarly, China should be divided into the CPC, federal and provincial governments, state-owned and private enterprises, and individual migrant traders (Gonzalez-Vicente, 2011), with private enterprises much less engaged with the "going out" strategy of the government than state-owned enterprises (SOEs) (Gu, Chuanhong, Vaz & Mukwereza, 2016).

Mohan has described the fragmentation amongst academics, amongst the experts on internal processes in China, amongst others who have examined Chinese economic activities in individual African nations, as well as the strongly ideological accounts of China's external relations and largely non-African accounts of Africa (Mohan, 2013a). The challenge he posed was to paint a more complete picture of China-Africa engagements, drawing on a variety of perspectives, disciplines, case studies and data. This article aims to provide one such case study, for the telecommunications sector (Sutherland, 2016). It next examines the general economic engagement of China in Africa, followed by short analyses of telecommunications in China and

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then in Africa. This is followed by a review of the various areas of Chinese activity in African telecommunications markets. Finally, conclusions are drawn and issues identified for further research.

2. China in Africa

The commercial and political presence of China in Africa, has been extensively analysed, with growing interest in military activity (e.g., its naval base at Djibouti). The USA has been a severe critic of the allegedly unscrupulous behaviour of the Chinese (Bräutigam, 2011; Power, Mohan & Tan-Mullins, 2012). Concerns about its government and multi-national enterprises (MNEs) may reflect differences from, rather than being better or worse than, the behaviour of the former colonial powers, reflecting centuries of viewing Africa as a target for colonialisation.

Firms from the European Union and North America are expected to support democracy, environmental protection, human rights, good governance and transparency, through public and, increasingly mandatory, commitments to the *OECD Guidelines for MNEs* (OECD, 2011). Those from China are considered uninterested, as are MNEs from the Persian Gulf. Yet MNEs based in OECD countries have pandered to kleptocrats, paid bribes, supported nepotism, sold wire-tapping equipment, and disregarded environmental damage. Nonetheless, by engaging with any and every government, China and Chinese MNEs are accused of setting back the, admittedly limited, progress made in governance and human rights (Gu, Humphrey & Messner, 2008; Noman, Botchwey, Stein & Stiglitz, 2012).

Sustained economic growth in China increased demand for gas, oil and metallic ores far beyond its domestic resources, leading to a pursuit of licences and mining rights across Africa, raising volumes traded and unit prices paid (Zafar, 2007). Chinese firms, often SOEs, outbid manufacturers from OECD countries on infrastructure projects, and elsewhere were supported by loans from Chinese development banks, and aided by inter-governmental negotiations, allegedly increasing Chinese bargaining power when acquiring natural resources (Vines, 2007). The Chinese government issued innovative loans secured against natural resources (e.g., oil from Angola and copper from Democratic Republic of the Congo [DRC]), and sometimes paid in infrastructure, the value of which is not easily assessed. These "Angola mode" deals were an alternative to IFI loans with their structural adjustment programmes (SAPs) (Habiyaremye, 2016). The provision of infrastructure allowed China to use its development expertise, deploying teams of architects, engineers and, even, construction workers to build hospitals, railways, roads, and schools, some of the infrastructure later being used to transport oil and ores to Chinese ships. Mineral extraction was supposedly performed in enclaves, with strongly Chinese characteristics: their own workers, rice and, even, cooking oil (Michel & Beuret, 2009). The most outrageous allegation was that gangs of convicts had been transported to Africa to reduce labour costs (Hairong & Sautman, 2012).

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Economic reforms brought a sustained boom in manufacturing in China, attracting significant elements of global production facilities, to take advantage of the lower labour costs and access to its domestic market. At the same time, the SAPs, advocated by the IFIs and adopted by governments, opened African markets to imports (Riddell, 1992). The resulting flow of cheap Chinese manufactures undermined already limited African production, diminished exports and created trade deficits, except for those countries with mineral and petroleum exports. Thus, Franks and Ribet (2009) argue that:

> Although African consumers certainly benefit from goods many could previously not afford (especially electrical items), cheap Chinese goods have also contributed to the decline of industrial production and the growing retrenchment of workers. (Franks & Ribet, 2009, pp. 133-134)

To make matters worse, displaced workers typically moved into low productivity activities, such as agriculture and informal employment (McMillan, Rodrik & Verduzco-Gallo, 2014).

Special economic zones (SEZs) were established in Algeria, Egypt, Ethiopia, Mauritius, Nigeria and Zambia to allow Chinese manufacturers access to markets less competitive than China and to transfer activities that could be replaced by more sophisticated manufacturing at home (Bräutigam & Tang, 2014). Information and communication technologies (ICTs) were limited, with Mauritius having some ICT services and the Lusaka SEZ said to have had electronic assembly. However, the SEZs were plagued with delays and generated very limited spill over of knowledge, failing to benefit local economies (Hanusch, 2012; World Bank, 2011).

In the cities of Guangzhou, formerly Canton, and Shenzhen are found large numbers of African traders, many as visitors, though some are now residents, seeking to purchase goods for resale in Africa (Bodomo, 2010; Lyons, Brown & Li, 2013). Textiles, clothing, household fixtures, electrical and electronic goods (notably mobile phones and tablet computers), are shipped to Africa by air and by sea, some passing through third countries to avoid customs duties and import restrictions in their intended markets. Some individual Chinese have taken the opportunity to move to Africa, becoming retailers and displacing local traders.

The evolving economic relationship between China and Africa remains contentious and contested, seen as both exploitative and mutually beneficial, presently being tested by the realignment of the Chinese economy.

3. Telecommunications in China

Set apart from global best practice in telecommunications policy, the sector in China has, nonetheless, seen dramatic transformations. The reforms launched by Deng

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Xiaoping saw the extension of the fixed telephone network, soon outpaced by mobile telephony, initially in cities and later the countryside, achieving near universal availability (Harwit, 2004; 2007; Xia, 2016a; 2016b). This was enabled and driven by the growth of manufacturing in China, of both handsets for customers and network equipment for operators, the result of foreign direct investment (FDI), first in manufacturing and then in research and development (R&D). Network competition was limited to state-owned enterprises (SOEs), in contrast to Russia, where privatisation came first, handing control to oligarchs, from whom it has never been recovered (Stiglitz, 1999). Internet access is behind the "Great Firewall of China",[2] allowing domestic providers of apps, content and services to grow very large, protected from foreign competition by SOEs or state-linked corporations, under the guidance of the CPC/state, seeking to (i) develop economic capability; (ii) shift from importing foreign to exporting indigenous technologies; and (iii) develop a service sector, including content and application providers.

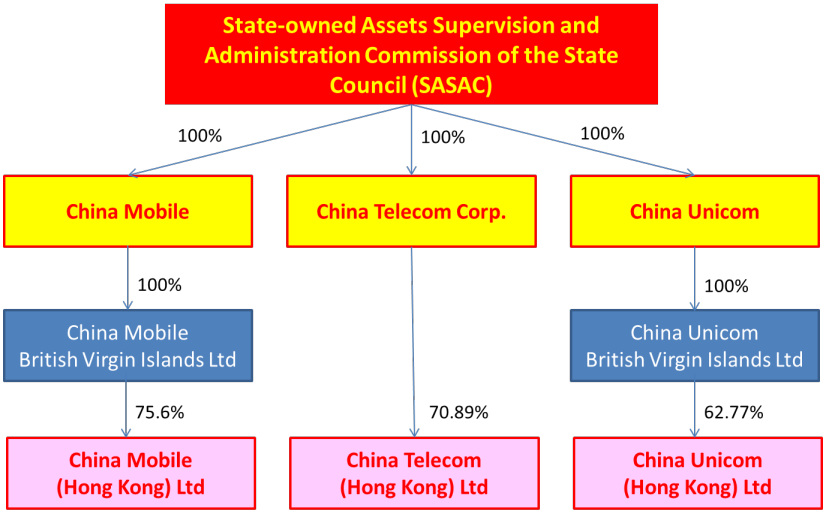
China is an increasingly powerful player in global production networks (GPNs), in which the activities of MNEs are spread across many countries (Coe, Dicken, & Hess, 2008). In telecommunications it is involved in all stages of the value chain, including research and development; standard setting; design; manufacture; construction and management of networks for operators; and provision in China of a full range of telecommunications and Internet services, and applications.

China joined the World Trade Organisation in 2001 (WTO, 2015), and committed to liberalise its telecommunications markets (DeWoskin, 2001; Zhang, 2001), despite which, SOEs remain overwhelmingly dominant. The expectation had been that liberalisation would open the way for FDI, with foreign operators providing the expertise and finance essential to expand and upgrade networks (Fu & Mou, 2010). Instead, the government created three SOEs from the state provider, instructed them to compete, one with another, while their expansion was funded from their own revenues and by minority flotations on the Hong Kong Stock Exchange (HKSE) (see Figure 1) (Loo, 2004). The choice of the British Virgin Islands (BVI), an opaque, offshore corporate registry, for two holding companies has never been officially explained. While Shen (2012) suggests the structure is because of "tax, legal and regulatory concerns", this makes little sense, since these could easily be modified by the government. BVI can be for tax avoidance and the concealment of transactions, part of an increasing circulation of money between China and the Caribbean. Its use for allegedly corrupt dealings by the Chinese elite has been highlighted by the International Consortium of Investigative Journalists (ICIJ, 2014).

2 Officially known as the Golden Shield.

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Figure 1: Ownership of the three Chinese operators[3]



The superficially strange model of competition amongst SOEs is surprisingly effective (Mora & Wiktorowicz, 2003; Xia, 2012). It is subject to opaque political direction by the State-owned Asset Supervision and Administration Commission (SASAC), which acts more as a regulator, ensuring political control, reinforced by a CPC committee inside each firm (Yeo, 2009).[4] This is considered essential to deliver economic growth, which helps to legitimise the government (Yeo, 2013). Liberalisation was begun with eleven Chinese firms selected to become mobile virtual network operators (MVNOs) (Barton, 2014), though they have made little progress in the face of competition from the three dominant and entrenched SOEs (Zallman, 2016).

The selection of 3G technologies was on governmental, not commercial, criteria. Each operator was required to adopt a different 3G network technology (see Table 1), providing test-beds and showcases to support exports by Chinese manufacturers:

> Although adopting multiple standards may not be consumer friendly, may create issues of interoperability and may be less cost effective by increasing the cost for managing the infrastructure, it nevertheless has provided a resolution to sensitive issues concerning China's WTO commitments, and satisfies the TD constituency. (Stewart, Shen, Wang & Graham, 2011, p. 781)[5]

3 The only significant foreign investment is a crossholding between Telefónica de España and China Unicom.

4 For example, Wang Xiaochu, Chairman of China Telecom and Chairman of the Party Committee at China Telecom, has also been an alternate member of Central Party Committee from 2007.

5 More fully TD-SCDMA or Time Division Synchronous Code Division Multiple Access, it is the Chinese version of 3G, a technology that might well have been rejected had the operators made purely commercial decisions.

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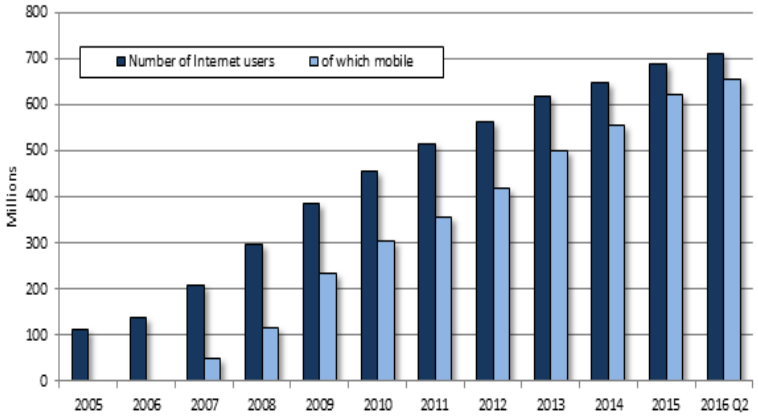
This was repeated with 4G, when the government initially licensed the Chinese version (TD-LTE) and only later the global version (FDD-LTE) that two of the operators had sought, despite 4G being a priority in its 2013 broadband strategy. China Mobile quickly deployed an extensive TD-LTE network, partly because its Chinese technology 3G network had been commercially disadvantageous.

Table 1: Mobile technologies used by Chinese network operators

Generation	China Mobile	China Unicom	China Telecom
3G	TD-SCDMA	UMTS	CDMA2000
4G	TD-LTE	TD-LTE & FDD-LTE	TD-LTE & FDD-LTE

The overall result is impressive, in both geographic and demographic reach (see Figure 2), and progression through technological generations, with over 500 million 4G users at the end of 2016 Q1 (Qiang, Bhavnani, Hanna, Kimura, & Sudan, 2009; Xinhua, 2013; CNNIC, 2016).

Figure 2: Internet users in China



Source: CNNIC (2016)

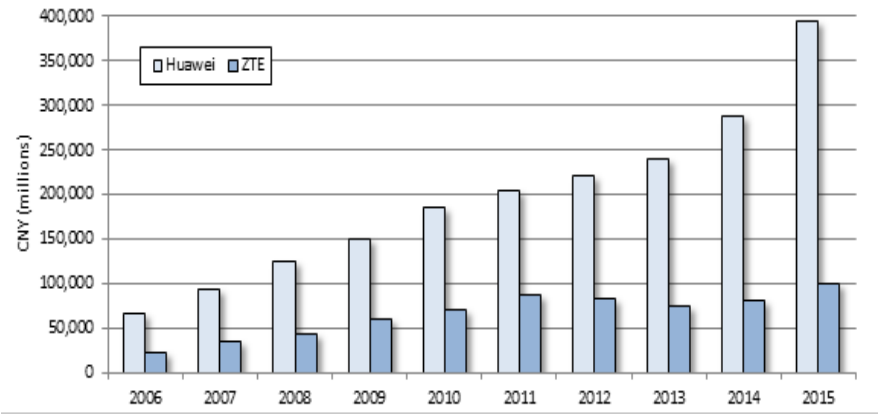
Unlike the manufacturers, the operators did not follow the "going out" imperative from government, declining the many opportunities for foreign expansion, not least in Africa. The exception is China Mobile, which has two modest investments in China Mobile Pakistan (t/a Zong);[6] and True Group of Thailand.[7] The preference of the CPC/state was that they invest in domestic operations, especially in upgrading to new technologies. Huawei and Zhongxing Telecommunication Equipment

6 In 2007, it acquired 100% from Millicom.
7 In 2014, it acquired 18% for USD880 million.

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Corporation (ZTE), the two leading manufacturers, have both "gone out" on a large scale, becoming significant players in the global market (see Figure 3), seen as exemplars of emerging economy multinational enterprises (EE-MNEs) (Sun, 2009). Their overseas expansion has been backed by the government and supported by the China Exim Bank, China CITIC Bank and China Development Bank.

Figure 3: Revenues of Huawei and ZTE



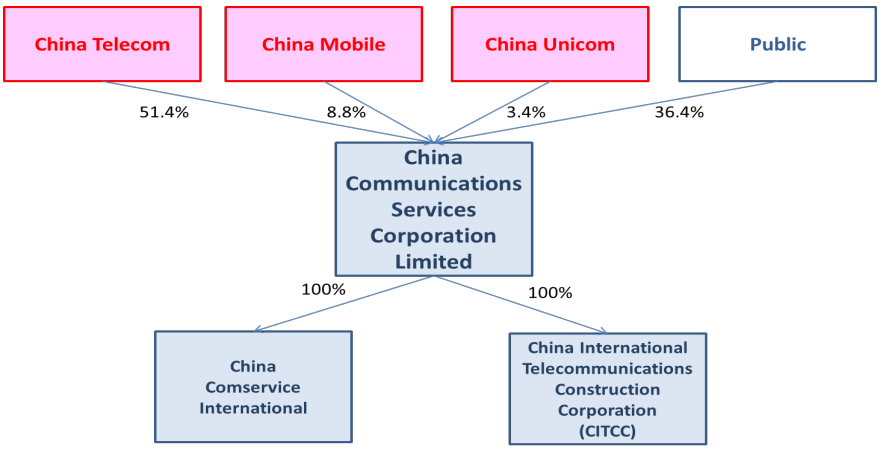
Source: Huawei Annual Reports (2006-2015), ZTE Annual Reports (2006-2015)

The Directorate General of Telecommunications (DGT) had a unit for the project management, design and construction of networks. This had originally been spun off in 1999 as part of China Telecom, from which China Netcom, the northern part, was later spun off. In 2006, China Telecom, which held the southern part, spun off China Communications Services Corporation Limited (CCS), listing it on the HKSE (see Figure 4). Then in 2011, CCS acquired the northern part, which had been separated from China Netcom as China International Telecommunications Construction Company, for CNY505 million (CITCC, 2013).[8] CCS has been the principal builder of mobile networks in China, with CITCC supporting the manufacturers by building networks overseas.

8 China Netcom was later acquired by China Unicom.

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Figure 4: China Communications Services Corporation Ltd



Source: CCS (n.d.)

The market for handsets is more complex and more competitive, with the government having initially licensed selected manufacturers, while others operated as *shan zhai* or mountain fortress bandits, producing cheaper and more disruptive devices (Zhou, Tong & Li, 2011; Lee & Hung, 2014; Chubb, 2015; Dong & Flowers, 2016). These firms evaded controls, initially in "mosquito" factories, assembling phones that were stylish, gimmicky, or imitated the latest models of the major domestic and foreign manufacturers, but at much lower prices, based on chip sets that had the core functions of a phone, developed by MediaTek (MTK) and Spreadtrum (Tse, Ma & Huang, 2010).[9] They opened new markets, for poorer citizens, especially those in smaller cities and the countryside, but were also taken by those "going out" to developing countries. The lifting of the licensing requirement in October 2007 legitimised the *shan zhai* manufacturers, which had proved nimbler than the licensed firms. The most remarkable story has been the rise of Xiaomi, founded in 2009 and a global player within five years, but seems to already be failing to make the transition to more expensive devices, unlike Oppo and Vivo (Shih, Lin & Luarn, 2014; IDC, 2016).

The Great Firewall blocks access to foreign Internet services (Ensafi, Winter, Mueen & Crandall, 2015; Li & Reimers, 2015; Minzner, 2015; Stevenson, 2007; Yuen, 2015), behind which there grew up providers of a range of applications and content, some of which are now amongst the largest Internet companies (e.g., Alibaba, Tencent and Weibo).[10] The suppliers grew rapidly by replicating business models devised in developed economies (e.g., search and social networking), in effect import-substitution

9 Among the features added were ultraviolet lights to test the authenticity of banknotes and dual-SIM card slots to avoid the limitations of a single network.

10 e.g., Tencent's first product was a copy of ICQ, a US-based instant messaging service, otherwise banned in China.

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industrialisation (ISI). One domestic requirement has been for very tight controls, sometimes styled "censorship 2.0", involving both automatic and human interventions (King, Pan & Roberts, 2014). Thus while Baidu, the dominant Chinese search engine, embraced censorship and collaboration with government, Google retreated to Hong Kong, SAR, to avoid compliance and in order to protect its global brand (Lu, Hu, Liang, Lin & Peng, 2013), while Facebook has been developing censorship capabilities to enter the market (Frier, 2016).

The Chinese government has run a campaign against corruption, including prosecuting some formerly very senior figures (Chow, 2015). Chang Xiaobing, resigned as Chairman of China Telecom, because of investigations into his former role at China Unicom (BBC, 2015). Li Hua, former chairman of the Sichuan branch of China Mobile, was convicted of accepting more than USD2.5 million in bribes (Barboza, 2011). Zhang Chunjiang, who had held posts in a provincial administration, China Netcom and China Mobile, was sentenced to death following his conviction for bribery, with his personal assets confiscated and political rights stripped (SCMP, 2011). He had taken CNY7.46 million in bribes from a telecommunications company and an advertising company. Additionally, there have been a few overseas prosecutions for bribery, for example, ZTE managers were convicted in Algeria and Lucent was found by US authorities to have bribed officials from an unspecified Chinese operator.[11]

Today, China is a leading global supplier of network equipment and handsets, and an exemplar of the widespread adoption of telecommunications and the Internet, albeit strictly censored. However, its model is not replicable, because of the enormous domestic economies of scale, the decades of planning, and the carefully acquired skills in manufacturing, design, research and standardisation. Nor is it easily understood, because of the opaque processes of competition amongst SOEs, corporate political activity (Gao, 2008), compliance with censorship and the movement of officials between party, government and operators.

4. Telecommunications in Africa

In the years following their independence, African countries neither changed direct state provision nor encouraged expansion of their fixed networks, with post-colonial governments maintaining moribund institutions and policies (Noam, 1999). Starting only about 15 years ago, there came the unexpected rise of mobile services, with the acceptance of major policy changes: introducing competition, private capital and cellular wireless technologies. The crucial retail innovation was the prepaid offer, turning niche markets for elites of a few thousand into mass markets for millions.[12] This is now being extended from voice and text messages to mobile Internet access,

11 *SEC v. Lucent Technologies Inc.*, Civ. Act. No. 1:07-cv-02301 (D.D.C.) (RBW) (filed December 21, 2007) and in re Lucent Technologies Inc. (November 14, 2007).

12 While the unit prices might have been high, spending was easily controlled.

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supplemented by limited offers of fixed broadband. There was also a surge of investment in undersea cables, both purely commercial and with governmental involvement (Song, 2015).

Analyses of telecommunications have generally been framed in terms of "divides" compared to the OECD countries. Each discipline created its own interpretation of this divide, whether the availability of networks or their use, through to the reaping of the social and economic benefits, and political participation (Fuchs & Horak, 2008; James, 2016, pp. 89-93; Pick & Sarkar, 2015, pp. 275-310). Complex spatial patterns were identified, with variations between countries, and between cities and the countryside (Chéneau-Loquay, 2007). One divide that affects future economic growth is the use of ICTs in higher education (Pehrson, 2010; Rye, 2008). It is sometimes inverted into a, perhaps overly optimistic, "digital opportunity", raising difficult questions as to who might grasp this and the conditions they would require to succeed. The poorer performing countries and operators have been ignored or glossed over, playing down the challenges of overcoming weak governance, providing high quality services, any service at all in remote areas, or affordable services for the urban poor.

The growth of the revenues of mobile operators has been slowing, reflecting declining expansion in subscriber numbers, increasing competitive pressures and regulatory actions (GSMA, 2015). In Sub-Saharan Africa the recent compound annual growth rate (CAGR) has been 7%, with the broadly defined mobile ecosystem generating 5.7% of GDP, forecast to rise to 8.2%, due to increased use of mobile broadband. In 2014, capital investment was USD9 billion and the sector employed 4.4 million, with operators collecting USD15 billion in taxes for governments, in addition to the payment of licence and regulatory fees, plus one-off spectrum auction fees.

Gillwald (2013) asserted that "mobile is closing the voice and the data gap in Africa", in effect that it was catching up with the OECD countries. Yet Informa (2010) used a factor of 1.24 to reduce reported mobile subscriptions in Africa to real and distinct individuals, further lowered by the mobile operators using a factor of 2.0 (GSMA, 2012). The number of active SIM-cards held by an individual varies between and within countries, allowing them to switch networks to make cheaper on-net calls, because of distortions in tariffs and wholesale rates; overcome poor coverage by operators; and avoid congestion, because there are too many customers on a network (Sutherland, 2009). These market problems have been ignored or inadequately addressed by governments and regulatory authorities.

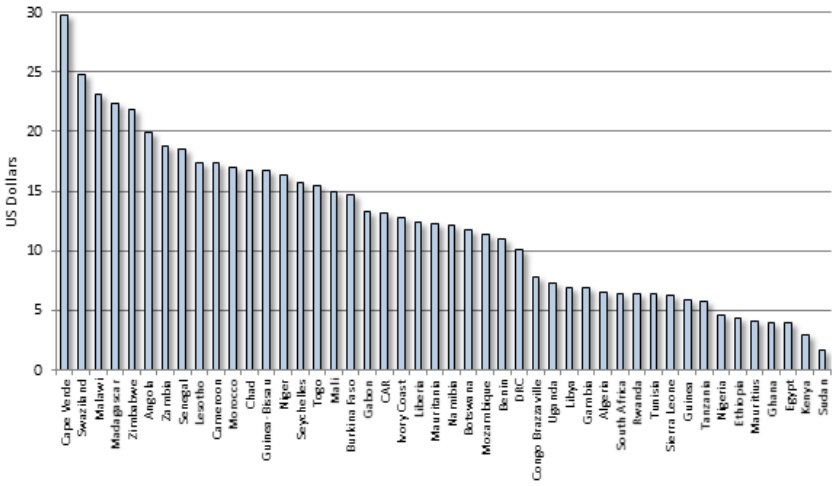
Although the policy and regulatory approaches were largely derived from the European Union (Stork & Gillwald, 2014), governments failed to collect the data and to use the competition analyses, impact assessments and public consultations that the EU considers essential, whereas, regulatory authorities have engaged in an almost

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obsessive registration of SIM-cards. This is despite obvious limitations of inadequate information systems, weak cyber security, unreliable national identity documents and transcription errors, leading to inaccurate databases, without evidence of their use in criminal prosecutions (Donovan & Martin, 2014).

Figure 5 shows the range of prices, far greater than any underlying cost differences, with many countries lacking sufficient competition to drive prices down or regulations that might substitute for or complement that competition. Consequently, for many people mobile services remain unaffordable, while for others they are only intermittently within reach (Duncan, 2013; Powell, 2014). Unfortunately, regulatory authorities do not measure affordability, leaving that to researchers.

Figure 5: Cheapest prepaid offers for OECD "40 call basket"



Source: RIA (2013)

The second claim by Gillwald (2013), about the closing data gap or "digital divide", is more difficult to assess. The majority of Africans still have no access to the Internet and those that do are constrained from using bandwidth-intensive services, such as Netflix, Skype and YouTube, as the result of usage-sensitive tariff structures.[13] There are currently bitter arguments about the merits of zero-rated tariffs and "free" Wi-Fi. Any services paid for by advertising or customer data present severe problems, given the weakness of consumer protection and privacy laws and of enforcement agencies. There has been only limited, but growing, deployment of fibre to the home (FTTH), with most consumers relying on mobile services, raising questions about availability,

13 e.g., download caps and per-megabyte charges.

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affordability and network quality, and of the lack of agreed metrics to measure progress, in particular in determining the depth and richness of the experience of the use of mobile services.

Given the need for substantial further investment in infrastructure, the ability of operators to maintain and upgrade networks, which is essential to carry growing data traffic, revenues are a central concern (Williams, 2008). If retail prices are too high, then use will be discouraged and revenues will be insufficient, similarly, if too low, they will require unaffordable investments in infrastructure. A global pattern of customers switching from paying services to apps offering free voice and SMS threatens operator revenues, diminishing their incentives to invest in networks (Jayakar & Park, 2014; Peng, 2016; Xu & Chen, 2016).

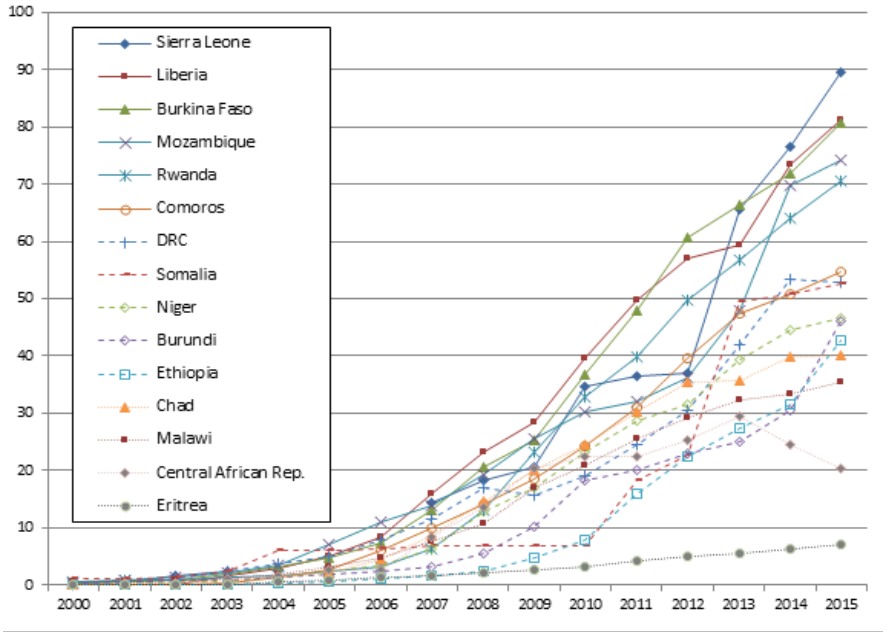
While ministers talk about competition and are supported by operators, mobile markets are oligopolies with little prospect of further market entry, and significant risks of consolidation.[14] Competition is constrained by first-mover advantages and by global allocations of spectrum, which permit only a very few operators, and the subsequent national assignments of spectrum to operators, which has been conducted with little transparency, with lobbyists fighting over each successive licence and spectrum band. Ownership is dominated by a handful of major multi-national groups (Curwen & Whalley, 2011; Sutherland, 2007): Bharti Airtel (India); Etisalat (UAE); MTN (South Africa); Orange (France); and Vodafone Group (UK).

Not all African countries have been willing to adopt the best practice policies pressed on them by the IFIs, with a few preferring to retain a monopoly state provider, while others lacked the ability or did not have the "good governance" necessary for implementation and thus investment. Some were too small to achieve economies of scale for multiple operators. Nonetheless, Figure 6 shows the use of mobile telephones in the poorest performing African states, where there is solid growth, with the sole exception of Eritrea, where the government seems intent on depriving its citizens of access to telecommunications. In part, these successes are due to the diffusion of successful business models and commercial practices, with smaller and weaker operators copying nearby countries, aided by manufacturers and software houses offering the necessary technical support and vendor finance.

14 As seen with the disappearance of Yu Mobile (Essar) in Kenya.

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Figure 6: Mobile teledensities in poorer performing countries in Africa



Source: UN (2015)

Civil conflicts and their aftermath present challenges to good governance, supposedly a requirement for well-ordered markets, so that investors ought to have been hesitant, an obstacle which seems to have been overcome. Micro-states lack economies of scale in both markets and institutions, the former undermining profitability and the latter limiting the ability to implement the policies and regulations, yet these too have growing mobile markets.

Mobile banking has been an area of mixed successes, with mobile operators bringing banking and financial services to some of the "unbanked" and obtaining a slice of the very substantial remittance business, but with some governments having been reticent (Buku & Meredith, 2013; Dunn, 2015; Hughes & Lonie, 2007; Jun & Palacios, 2016; Suárez, 2016). Initiated in Somalia, it was quickly overtaken by M-Pesa in Kenya, a service from the state-owned Safaricom working as a "fast follower". However, in countries where the banks are well established, there has been resistance from banking regulators, supported by banking lobbyists.

Through mobile networks and prepaid services, using a model of limited competition amongst commercial operators, Africa has shown substantial growth. This has spread

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into almost all countries with variations of the global best practice model, even where the prerequisite of good governance appears to be absent, as operators copy business models and commercial practices. Capital and technology are overwhelmingly foreign,[15] though with some development of apps for smartphones and tablet computers in innovation centres with venture capital in Kenya and South Africa (Kelly, 2014).

5. Chinese telecommunications in Africa

At the Forum on China-Africa Cooperation (FOCAC), Chinese then-President Jiang Zemin noted that (Zemin, 2000): "The gap between the North and the South is being widened not only economically, but also in science and technology. Hence, there has emerged a disturbing 'digital divide'." Chinese efforts to address this have included loans by development banks; sale of network equipment, handsets, smartphones and tablet computers; network construction and management; and exchange of voice telephony and international mobile roaming traffic. There is little, if any, presence of network operators, and only limited presence of service providers, such as Tencent and Weibo, with some virtual private network (VPN) services provided by PCCW.

In OECD countries, mobile operators are a principal distribution channel for handsets for the larger manufacturers, which bundle them with services, together with large chains of electronics or specialist stores. In Africa, where the majority of customers are pre-paid, they mostly buy cheaper, entry-level or second-hand devices, with operators offering own-brand Chinese handsets at low prices.[16] Electronic equipment, including phones, is available through semi-formal channels, along with the other manufactures brought from China by traders. Governments have become concerned by no-brand and "counterfeit" handsets, which challenge the profit margins of the major brands and tax revenues, but increase consumer welfare through the cheaper adoption of mobile telecommunications (ITU, 2010; ITU-T, 2012; ITU-D, 2014).

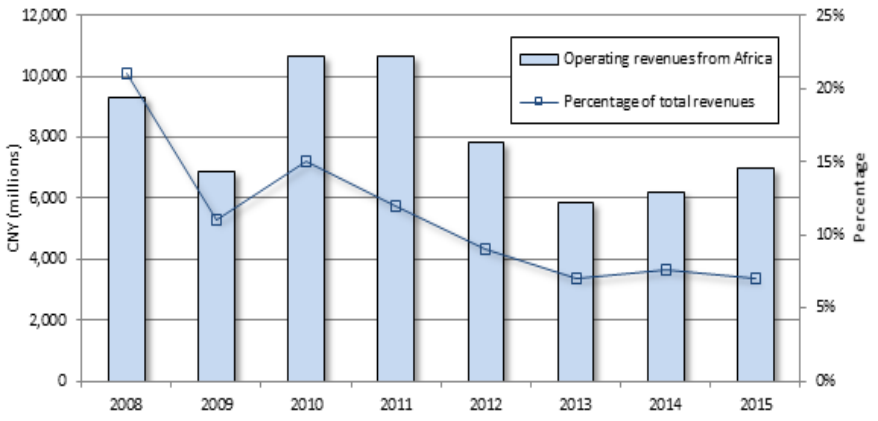
The design and manufacture of network equipment is capital intensive, with formal purchasing procedures, in which well-financed operator groups buy and install competitively priced equipment, frequently from Huawei and ZTE (see Figure 7). The manufacturers also tender for and often win supply contracts funded by the IFIs.

15 An exception is Nigeria, where domestic entrepreneurs operate two networks.

16 For example, MTN South Africa offered a "Steppa" 3.5-inch Android smartphone with a Snapdragon processor for ZAR499, with three months free social networking (ITWeb, 2014).

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Figure 7: ZTE revenues in Africa



Source: ZTE Annual Reports (2008-2015)

Where an operator lacks the necessary organisational capacity, the equipment can be installed by CITCC and, if necessary, operated by it:

> Having carried out the "going global" strategy of the CPC Central Committee, CITCC has witnessed a stair-like expansion of business from economic assistance projects, subcontracting projects to contracting projects in overseas communication engineering construction market. Its general contracting construction projects such as national backbone cable networks in Ethiopia and Nigeria have been well received by the governments and owners. Acting as the first general contractor of overseas large communication projects among Chinese communication construction enterprise, CITCC has built up a good professional enterprise image in international market. (CITCC, 2014)

The ruling Ethiopian People's Revolutionary Democratic Front (EPRDF) rejected liberalisation and privatisation, insisting on a state controlled monopoly, resulting in a break with the IFIs and forcing Ethiopia Telecoms Company (ETC) to look elsewhere for finance (Workneh, 2014; 2016). ETC signed major contracts with Huawei, ZTE and CITCC, worth USD2.4 billion in 2006, for a 2G network, later extended to 3G and 4G, and expanded coverage (Cheru, 2016). This was supported by Chinese development banks, without any investment by the Ethiopian government, all the costs being recovered from customers, with the government also extracting significant profits (Davidson, 2012). ETC was rebranded as Ethio-Telecom and placed under the management of Orange from 2010 to 2012, but this contract was not renewed. The result has been the façade of an Ethiopian SOE, behind

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which were three Chinese SOEs doing much of the work. Despite comparatively low teledensity (see Figure 6), the government justifies the maintenance of state ownership by extracting an estimated USD3.5 billion generated, to pay for other infrastructure. Between 2010 and 2012, reports emerged that indicate the Ethiopian state's utilisation of technologies both to exercise targeted electronic blackouts and to carry out widespread online surveillance [anti-terrorism laws]. The facility to monitor and track dissidents has proved controversial, with the government acquiring software from European firms to supplement the facilities offered by Huawei and ZTE (HRW, 2014).

The Union of the Comoros rejected repeated calls from the IFIs for the privatisation of Comores Telecom (Comtel), formerly the *Société Nationale des Postes et Télécommunications* (SNPT). Instead, Comtel upgraded its mobile network and inter-island links with support from China. The IFIs continued to press for privatisation, as part of its Heavily Indebted Poor Countries (HIPC) programme, which was rejected by the Comoran Parliament, though with the concession of a possible second mobile licence from the Autorité Nationale de Régulation des TIC (ANRTIC).[17] From a short list of Mauritius Telecom and Telecom Malagasy (Telma) of Madagascar, it chose the latter, then, bizarrely, sought regulatory support from Madagascar (Telegeography, 2015; 2016).

Given the development of Chinese mobile standards and the strong presence of Chinese manufacturers, these networks might have been expected to be deployed in Africa. Yet, most of the 4G networks are using global FDD technology, with TD-LTE having been taken up mostly by fixed wireless ISPs, seeking to replace their WiMAX networks that had proved a commercial and technological dead-end (see Table 2). Some mobile operators offer both FDD and TD-LTE.

Table 2: TD-LTE networks in Africa

Country	Operator	Launch
South Africa	Telkom	April 2013
Uganda	MTN	April 2013
Nigeria	Spectranet	August 2013
Nigeria	Swift Networks	November 2013
Ghana	NITA	February 2014
Ivory Coast	YooMee Africa	April 2014
Madagascar	Blueline	April 2014
Angola	Net One	August 2014
Ghana	Blu Telecoms	October 2014
Uganda	Vodafone	February 2015
Gambia	Netpage	March 2015

17 The candidates were Mauritius Telecom and Telecom Malagasy (Telma) of Madagascar.

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Nigeria	MTN Hynet	July 2015
Nigeria	Cyberspace	August 2015
Tanzania	Smart	August 2015
Cameroon	MTN	December 2015
Tanzania	TTCL	December 2015
Ghana	Busy	January 2016
Nigeria	Bitflux	August 2016

Source: GSA (n.d.), GTI (n.d.), Telegeography (n.d.)

Given the heavy Chinese involvement in infrastructure projects, it is unsurprising that many have added fibre optic cables to other networks (see Table 3). These contribute to national and regional backbone networks and are often interconnected with undersea cables, an activity where Chinese firms are not yet active. Chinese manufacturers have also been involved in selling digital broadcast equipment to support the digital switchover (Jiang, Li, Rønning & Tjønneland, 2016).

Table 3: Chinese support for backhaul networks

Countries	Network	Comments	Links to undersea cables
Angola	ADONES (Angola Domestic Network System)	Ericsson constructed undersea coastal cable 1,600 km, with 8 landing stations, operational since 2008. Angola Cables and Alcatel Shanghai Bell and ZTE building land-based fibre network.	ACE, SAT-3, WACS
Cameroon-Chad	Oil pipeline by China National Petroleum Company	Includes 12 optic fibres for Central African Backbone (CAB)	ACE, SAT-3, WACS
Democratic Republic of the Congo [DRC]	National fibre optic transmission network	USD36m from China Exim Bank in 2008 for CITIC to connect Kinshasa to and Moanda (undersea cable landing station) and USD223m from China Exim Bank for 3,250 km of fibre optic network by CITCC	SAT-3, WACS
Ethiopia	Upgrade to ETC/EthioTelecom network	Includes 10,000 km backbone network supplied by ZTE and CITCC	TEAMS, EaSSY, SEACOM, SEA-ME-WE-3 via Djibouti
Ghana	Sinopec	Fibre optic cables laid alongside pipeline from Atuabo to Accra	ACE, SAT-3, WACS
Ivory Coast	National fibre optic transmission network	USD210m for 6,700 km network by CITCC	ACE, SAT-3, WACS

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Kenya	National Optic Fiber Backbone Infrastructure (NOFBI)	KES6,040m loan from China Exim Bank, supplied by Huawei	TEAMS, EaSSY, SEACOM
Lesotho	National fibre backbone	USD20m loan from China	-
Kenya, Uganda, Burundi and South Sudan	East Africa Railway by China Road and Bridge Corporation (CRBC)	Optic fibre laid beside track	TEAMS, EaSSY, SEACOM
Malawi	Electricity Supply Corp. (ESCOM)	National fibre optic network, connecting with Mozambique and Zambia	-
Namibia	Nampower	Fibres installed, but not yet in use	-
Niger-Mali-Algeria	Links Bamako with Algeria and Niger	Exim Bank USD45m for 942 km fibre optic network	Several in Mediterranean
Tanzania	National Information and Communication Technology Broadband Backbone (NICTBB)	China Exim Bank loan USD170m, for construction by CITCC	EaSSy and SEACOM
Uganda	e-government backbone	ZTE supported by USD 160M Chinese government loan	-
Zambia	ZESCO	Fibre optic network alongside electricity distribution network	-
Zambia-Tanzania	Tazara Railway	Fibre optic network alongside railway network	EaSSy and SEACOM
Zimbabwe	Link to EaSSY landing station	Exim Bank	EaSSY

Source: AllAfrica.com (n.d.); Aid Data (n.d.); oAfrica.com (2013)

The pattern of Chinese involvement in African telecommunications is complex and sometimes opaque. Where there are commercial operators, whether large or small, its manufacturers supply equipment at competitive prices, even in countries where there is a conflict or its aftermath, with the risks partially offset by the home government. Where there is only a state-owned monopoly, Chinese vendors will build a network and, if required, manage it as an outsourcer, helping to implement generic commercial practices to boost customer numbers and revenues. Handsets are sold to operators, with and without brands, and to consumers through a range of channels, including branded, unbranded and counterfeit. Fibres are added to other network infrastructure, being used for national and regional backhaul. The approaches taken have been extremely flexible, seemingly unconstrained by the absence of good governance, enabling the growth of mobile telephony where it was least expected. Non-Chinese rival manufacturers rely on governments to be persuaded to open their markets and for operators to take advantage of the resulting licensing, after which they can sell equipment, giving them less scope than Chinese vendors, with their home country specific advantage of greater flexibility.

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6. Conclusion

In China the fused CPC/state remains a strong, if not always controlling, influence on telecommunication markets, owning the three principal operators, supporting manufacturers of network equipment, if not the handset manufacturers, and promoting indigenous standards, aided by officials moving between or straddling Party, state and SOEs. Manufacturers have followed the CPC/state invocation to "go out", scoring considerable successes, not least in Africa where it is helping to close its voice and data divides. At home operators and service providers have supported a strict system of domestic censorship, some of which has been made available for export. The CPC/state has delivered considerable successes in domestic services and "national champion" manufacturers, which helps maintain its legitimacy, using a policy model that is novel and which diverges significantly from global best practice.

African countries have never had any telecoms manufacturing capacity, have little or no research and development, and most governments, following the advice of the international financial institutions, privatised their state-owned operators, which in any event lacked economies of scale and the financial and commercial expertise to deploy new services.[18] Nonetheless, governments control policy and its implementation, even if it is largely copied from elsewhere, allowing operators to negotiate with presidents and ministers, often excluding consumers. The adoption of the GSM platform, complete with legislation, policies, business models and technologies, enabled only limited competition, primarily due to spectrum restrictions, but allowed incremental investments in networks with short payback periods, facilitating entry even in difficult circumstances (e.g., close to war zones). It also allowed a pre-paid service that was to permit mobile communications access to hundreds of millions of customers, who could control their spending. Adaptation occurred less in policy and legislation, than in implementation and use, influenced by lobbying, bribery, nepotism and state capture, with significant principal-agent and information asymmetry problems. Even flawed liberalisation allowed the entry of operators and the expansion of transnational groups, mostly from outside Africa, pursuing economies of scale and customer numbers. This enabled the widespread adoption of mobile services without drawing on the limited supply of government funding, while boosting economic growth and generating significant tax revenues.[19] These are not regulatory states, since the mechanisms for accountability are weak or absent, with governments finding their legitimacy in other ways, and markets operating with limited oversight.

China, having successfully transferred GSM technology from Europe, was able to match or undercut other manufacturers in price and quality to supply network

18 The exceptions are only partial privatisations in Kenya and South Africa, plus North African countries, which retained some degree of ownership.

19 The operators complain bitterly about the "high" level of tax (Deloitte, 2014), though it is passed immediately to consumers.

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equipment and handsets in Africa. While it has developed its own 3G and 4G technologies, sales of these in Africa have been limited, with multinational operator groups preferring other standards. Backed by the CPC/state and development banks, Chinese manufacturers have sold equipment not only to operators in states with good governance and relatively competitive markets, but also to those in micro-states and in states in varying degrees of civil strife and conflict, where there is limited hope of good (sometimes any) governance. The Chinese government offset part of the risk for manufacturers, through its development banks. Unless governments wilfully resisted, Chinese firms have found ways to boost the adoption of mobile telephony in order to sell equipment.

Technology transfer to Africa has been limited to a few training centres for operators. Unlike China, it lacked the skilled workforce needed for factories and, especially, for research and development. Consequently, the spill over effects have been limited, though they are growing with the rise of innovation systems around mobile apps.

Outsourcing has emerged as a policy alternative to liberalisation, privatisation and regulation, allowing the retention of at least the façade of state provision, though it is probably closer to a concession. This challenges global best practice in telecommunications policy as advocated by the IFIs, by not seeking to create well-regulated commercial markets and by disregarding good governance, instead pursuing latent demand by whatever means are available. Thus, remarkably, China offers two alternatives to global best practice: (i) commercial, engineering and management outsourcing; and (ii) competing state-owned operators. This points to the inflexibility of the IMF and World Bank, raising questions about their failure to explore alternatives, and which of the three options will perform best in the longer term, as technologies and markets evolve. Absent from these options is a genuinely radical or socialist alternative.

Further research is needed to explain the reluctance of Chinese network operators and content providers to enter African markets, as is an exploration of the physical distribution system for mobile phones from China. There are also questions about cultural differences between Chinese and African firms, managers and employees in the sector. It is essential to map and to analyse ICT ecosystems in Africa and the role of Africa in global production networks. The investments by manufacturers and operators need to be examined to determine the extent of foreign direct investments and to understand the flows of money for equipment and networks over the lifetime of contracts and loans. The limited African ownership in the multinational operators groups needs to be explored and explained. There is a pressing need to explore the Chinese contribution to the security services, their provision of systems for the interception of traffic and collection of metadata, of censorship, and of any spying they

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might perform on African firms and governments for China.[20] The supply of military telecommunications systems would also be interesting, if sufficient data could be collected.

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THEMATIC REPORT



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The Impact of the Call Termination Rate Reduction on Consumer Surplus in South Africa

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Abstract
This thematic report presents some initial data on mobile call termination rates, and the welfare improvement due to call termination rate regulatory interventions, in South Africa for the period 2010 to 2015.

Keywords
mobile, call termination rates, rate reduction, consumer surplus, South Africa

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1. Introduction

The Independent Communications Authority of South Africa (ICASA) reduced call termination rates, the price that operators charge one another to complete calls across networks, by more than 90% between 2009 and 2016. Important questions that arise are: (i) what impact has this call termination rate reduction had on consumers, and (ii) is the regulatory intervention worth maintaining in the future? The impact on retail prices has been dramatic, in line with the impact in other African countries (Stork, 2012; Hawthorne, 2015). While the impact on prices and profits has been assessed, including by Stork (2012), there has been no attempt to measure the consumer surplus effects of the call termination rate reductions in South Africa.[1] This thematic report is an introduction to understanding the consumer surplus effects of the call termination rate reductions and is part of a wider research project on the impact of call termination rate reductions on retail telecommunications service prices in South Africa.

A full analysis of total welfare requires the specification of demand and calibration of a model to simulate the welfare effects from price changes (Harbord & Hoernig, 2015). This would include assessing the impact of the termination rate reductions on producer surplus, in addition to consumer surplus. The analysis presented here, while partial, is a first step towards assessing the welfare impact of call termination rate reductions.

2. Brief note on literature and recent research on MTRs in selected African countries

Bohlin and Kongaut (2012) provide a useful summary of the empirical research into the impact of mobile call termination rates on retail prices and access to services, largely in developed countries. The results of these studies are contradictory. For example, Genakos and Valletti (2011) found that call termination rate reductions increased retail prices as a result of a "waterbed effect". The same authors, more recently, found that this waterbed effect had disappeared over time (Genakos & Valletti, 2015). Bohlin and Kongaut (2012) found that call termination rate reductions led to decreases in retail prices, while Pensendorfer and Veronese (2009) found no relationship between mobile termination rate (MTR) reductions and retail prices.

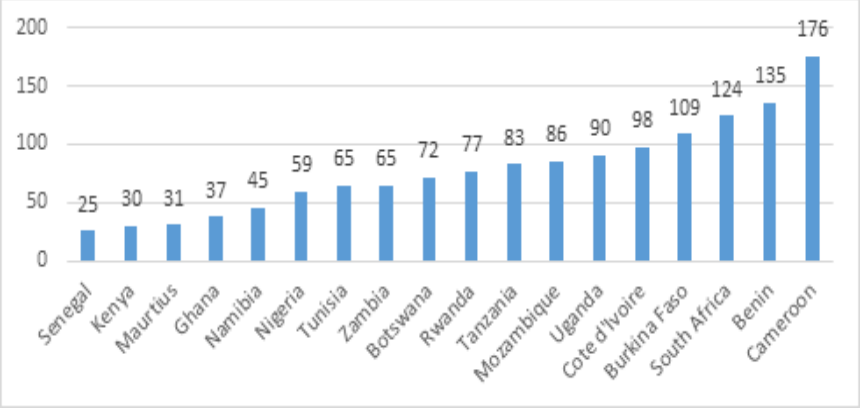
South Africa's mobile call termination rate in 2010 was comparatively high, against rates in Senegal, Mauritius, Ghana and Kenya, see Figure 1 below. Stork's (2012) review of the impact of MTR regulatory interventions in Botswana, Kenya, Namibia and South Africa relies on individual case studies, rather than cross-country econometric techniques, to assess the impact of lower call termination rates. As is the case in EU countries, call termination rates diverge significantly across countries in Africa, from as low as ZAR0.25 in Senegal to ZAR1.76 in Cameroon (Stork, 2012). It

1 Consumer surplus is the difference between willingness to pay and retail prices paid by consumers (Motta, 2004).

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is noted that South Africa's call termination rate has been significantly reduced since 2010, from ZAR0.89 (peak) to ZAR0.40 for MTN and Vodacom, and to ZAR0.44 for other mobile operators (ICASA, 2010a).

Figure 1: Mobile call termination rates in selected African countries (USD cents, at ZAR11 / 1 USD, 2010)



Source: Adapted from Stork (2012)

Where mobile call termination rates have been reduced through regulatory interventions in Botswana, Kenya, Namibia and Nigeria, Stork (2012) finds that retail prices declined, and in many instances the subscriber base and incumbent profitability increased (see Table 1 below). In Botswana, the regulator reduced call termination rates by 15% between 2010 and 2011 and Mascom reduced its prices (OECD high usage basket) by 5% (Stork, 2012). Kenya had the largest regulated decrease in call termination rates and saw the largest decrease in retail prices as a result of the Kenya Communications Commission's (KCC's) intervention. Call termination rates dropped by 84% between 2007 and 2013, by 65% between 2007 and 2010 alone (KCC, 2007; 2010). Between January 2010 and January 2011, Safaricom's (Kenya) retail prices dropped by 68% and its subscriber base grew by 59% (Stork, 2012). Safaricom's earnings before interest, tax, depreciation and amortisation (EBITDA) margin, a measure of profitability, declined from 51.7% to 43.6% (Stork, 2012), but the latter is still significantly above the EBITDA margins earned by mobile operators in South Africa, as discussed below.

The Namibian Communications Commission (RIA, 2009; Stork, 2012) reduced mobile termination rates from NAD1.02 to NAD0.60 in 2009, then, following a glide path, to NAD0.30 in January 2011. The final rate applied to both fixed and mobile networks, as was the case in Nigeria (Stork, 2012). MTRs declined by 51%

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from June 2009 to January 2010 (RIA, 2009). Between 2008 and 2010, the largest mobile operator, MTC, increased its subscriber base from 1m to 1.5m subscribers, and its EBITDA margin increased from 50.9% to 55.8% (Stork, 2012). Between 2008 and 2011, MTC's retail prices declined by between 37% and 58% (using the OECD low usage and medium usage baskets respectively) (Stork, 2012). The MTR in Nigeria was regulated by the Nigerian Communications Commission in 2009 (NCC, 2009) and was reduced by 28% (Stork, 2012). MTN, the largest operator in Nigeria reduced its prices between 2008 and 2011 by 37% (using the OECD high usage basket), while the total number of CDMA and GSM subscribers in Nigeria increased by 16% between 2009 and 2010 (Stork, 2012).

MTN in South Africa did not immediately reduce its retail prices. Nevertheless (in terms of the OECD high usage basket, using average prices), MTN's prices eventually declined, while MTN's subscriber base increased by 14% over the period December 2009 to December 2010 (Stork, 2012). Average retail mobile prices, including Vodacom's prices, in South Africa declined significantly after the mobile call termination rate intervention. This is discussed in more detail below.

Table 1: Mobile call termination rate reductions, price reductions subscriber base increases and incumbent profitability in Botswana, Kenya, Namibia, Nigeria and South Africa

Country (name of incumbent)	MTR reduction	Retail price change	Subscriber base change	Profitability
Botswana (Mascom)	2010-2014: 60% 2010-2011: 15%	Feb '10-Mar '11 Mascom (OECD high usage basket): -5%	No information in Stork (2012)	No information in Stork (2012)
Kenya (Safaricom)	2007-2013: 84% 2007-2010: 65%	Jan '10-Jan '11: Airtel: -81% Safaricom: -68% Orange: -54%	2007-2010 Safaricom: +59%	2007-2010 Safaricom's EBITDA margin declined from 51.7% to 43.6%
Namibia (MTC)	2009-2011: 72% 2009-2010: 51%	2008-2011 MTC cheapest product: -37% (OECD low usage) -58% (OECD medium usage) -46% (OECD high usage)	2008-2010 MTC increased its subscriber base from 1 million to 1.5 million	2008-2010 MTC's EBITDA margin increased from 50.9% to 55.8%
Nigeria (MTN)	28% for incumbents (NCC, 2009)	2010-2011 MTN (OECD high usage basket): -40%	2009-2010: +16%	No information in Stork (2012)

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Country (name of incumbent)	MTR reduction	Retail price change	Subscriber base change	Profitability
South Africa (MTN)	2011-2013: 52%* 2009-Oct 2010: 22%*	2010-2011 MTN (OECD high usage basket): no impact, discussed below.	Dec '09-Dec '10: +14%	No information in Stork (2012)

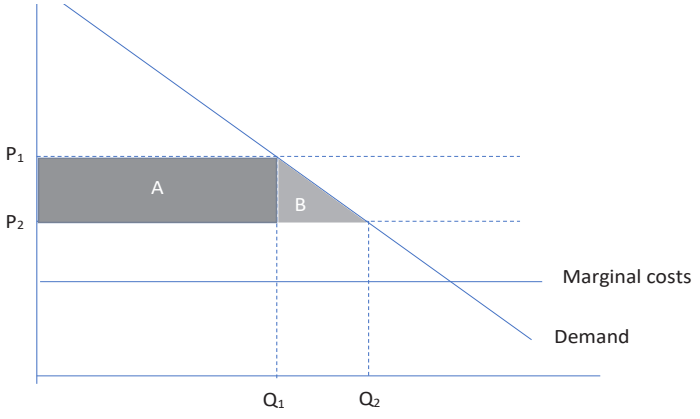
Source: Adapted from Stork (2012)
***Note:** Calculated using a simple average of peak and off-peak call termination rates*

An important feature of the Stork (2012) study is that, while the impact of MTR reductions on prices and profits have been evaluated, little has been done to calculate the overall magnitude of benefits to consumers, weighed against reduced firm profits.

3. Methodology

A standard linear demand model is used to estimate the consumer gains from mobile termination rate reductions following, Greenstein and McDevitt (2010). In order to employ this approach, we assume that all of the price reductions and volume growth over a period of time were attributable to the call termination rate reduction (this assumption is discussed in more detail below). We would need an estimate of the voice price reduction in each year (P_1 and P_2 on Figure 2 below) and growth in the volume of minutes consumed between one year (Q_1) and the next year (Q_2). We could then calculate the transfer from producers to consumers, Area "A" on the figure below, as follows: $(P_1 - P_2) * Q_1$. If we further assume that demand is linear, we are able to calculate the additional consumer surplus resulting from the reduction in deadweight loss to consumers, Area "B" on the figure, as follows: $(P_1 - P_2) * (Q_2 - Q_1) / 2$. Area "A" plus Area "B" equals the total improvement in consumer surplus arising from lower prices and greater volumes.

Figure 2: Calculation of welfare benefits from price reductions



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4. Results and brief analytical comments

We collated Q_1 and Q_2 from Vodacom and MTN's annual reports for 2009 to 2014, and from their interim results for 2015 (multiplied by 2 in order for an annual estimate).[2] For P_1 and P_2, we calculate blended prices from outgoing revenues, divided by volumes of outgoing minutes, using the same sources. Vodacom reports outgoing minutes and outgoing voice revenue, from which a price can be directly calculated. MTN reports monthly minutes of use per subscriber (MOU), and numbers of subscribers, and outgoing voice revenue. Total outgoing voice minutes of use can be calculated from the volume of MOU multiplied by the number of subscribers, multiplied by 12. Using this approach, it is estimated that consumers have benefited from price reductions and increased voice usage to the value of approximately R47 billion over the six years 2010 to 2015 (see calculations in Table 2 below).

Table 2: Welfare improvement due to call termination rate intervention

	2010	2011	2012	2013	2014	2015*
Vodacom						
Price differential (ZAR) (P_2-P_1)	0.17	0.17	0.09	0.21	0.15	0.09
Volume of minutes (m), previous year (Q_1)	18,792	22,160	26,340	28,349	34,300	38,500
Consumer savings (ZARbn) - Area A (P_2-P_1) x (Q_1)	3.18	3.85	2.31	5.90	5.10	3.55
Additional minutes (m), current year (Q_2-Q_1)	3,368	4,180	2,009	5,951	4,200	2,500
Consumer savings (ZARbn) - Area B (P_2-P_1) x (Q_2-Q_1) / 2	0.29	0.36	0.09	0.62	0.31	0.12
MTN						
Price differential (ZAR) (P_2-P_1)**	0.25	0.10	0.11	0.15	0.31	0.07
Volume of minutes (m), previous year (Q_1)**	12,339	16,053	18,243	21,354	21,896	32,584
Consumer savings (ZARbn) - Area A (P_2-P_1) x (Q_1)	3.05	1.60	2.08	3.13	6.80	2.29
Additional minutes (m), current year (Q_2-Q_1)**	3,714	2,190	3,110	543	10,687	4,015
Consumer savings (ZARbn) - Area B (P_2-P_1) x (Q_2-Q_1) / 2	0.46	0.11	0.18	0.04	1.66	0.14

2 We note that MTN may have changed its definition of outgoing minutes, or number of subscribers, or both, in that the MOU increased dramatically from 71 in 2013 to 97 in 2014, after being stable at between 69 and 71 between 2010 and 2013.

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	2010	2011	2012	2013	2014	2015*
Annual consumer savings (ZAR billion)	**6.98**	**5.93**	**4.65**	**9.69**	**13.87**	**6.10**
Total consumer savings (ZAR billion)						**47.2**

Source: Analysis based on MTN and Vodacom annual reports 2010-2014 and interim results 2015

Notes:

** 2015 data is estimated from Vodacom's interim results (as at September 2015) and MTN's interim results as at June 2015. Total minutes were annualised by multiplying interim results by 2.*

*** Volume of outgoing MTN minutes calculated by multiplying minutes of use per month by number of reported subscribers, by 12.*

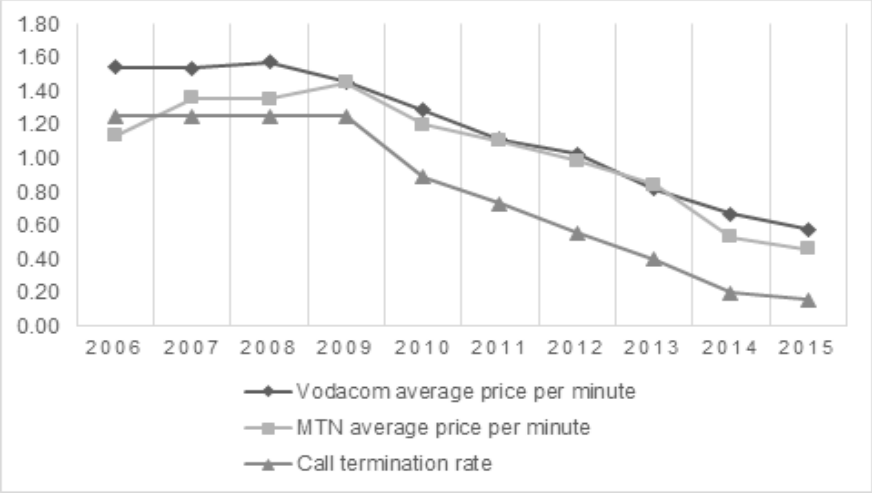
The gains to consumers fluctuated between approximately ZAR4 billion and ZAR14 billion per annum over the period 2010 to 2015. This variation in gains to consumers is significant and suggests that other factors affected pricing over the period, such as special pricing offers by MTN and Vodacom in response to smaller rivals Telkom Mobile and Cell C. It may be the case that not all the price reductions and volume growth are attributable to call termination rate reductions. Some of the increase in volume growth may be attributable to economic growth, or to increased mobile penetration over time. Prices may have declined somewhat, even absent the call termination rate intervention, due to increased economies of scale. Furthermore, Telkom Mobile entered the market in 2010 and may have played an important role in reducing prices, even absent the call termination rate intervention.

Nonetheless, it appears that prices were fairly stable prior to the call termination rate intervention in 2010, if not in fact increasing over time, which suggests that prices were not declining prior this regulatory intervention (see Figure 3). In addition, it isn't clear that Telkom would have been able to effectively compete, absent the call termination rate reductions. Economic growth was low and per capita income growth was very low in South Africa, which suggests that an increase in overall consumption demand per person is unlikely for the period under review (SARB, 2009-2015). While mobile penetration did increase over the period, this is unlikely to have accounted for the dramatic growth in volumes, for example from 19 billion minutes in 2010 to 39 billion minutes in 2015 on the Vodacom network.

Finally, note that the estimate of consumer benefits of ZAR47 billion, is almost certainly biased downwards, since we exclude from the calculations Cell C, Telkom Mobile and fixed to mobile calls from the fixed line operators in South Africa (including Telkom), all of which experienced lower retail prices and many of which experienced considerable growth in voice usage volumes (Hawthorne, 2015).

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Figure 3: MTN, Vodacom blended retail voice prices and peak call termination rates, 2006-2015



Source: See sources and notes for preceding Tables and Figures.

5. Conclusion

This brief review of data suggests that consumers have benefited significantly from the call termination rate reductions. A partial analysis, of only MTN and Vodacom's retail prices and volumes, suggests that consumer surplus increased by ZAR47 billion between 2010 and 2015. Including Cell C and Telkom Mobile in the analysis would mean that consumers have benefited significantly more.

Further work is required to assess the total welfare effects of the call termination rate reductions, including the impact on producer surplus and estimating the impact of the regulatory intervention on competition. It is also likely that the rate reduction benefited individual consumer groups in different ways, in other words, while pre-paid consumers likely experienced significant price reductions, post-paid consumers may not have.

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