MUCH ADO ABOUT NOTHING?

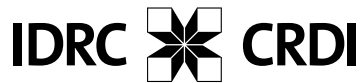## ZERO-RATING IN THE AFRICAN CONTEXT

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EXECUTIVE SUMMARY

A fresh, public-interested assessment of the zero-rating of certain applications (apps) and platforms in the African mobile prepaid environment is overdue. This policy paper examines the issue of zero-rating within the contexts of the range of discounted and dynamically-priced African mobile network operator (MNO) products, and the priority public policy issues facing the continent in relation to the Internet.

Affordable access to broadband networks is a necessary condition for the Internet to serve as a developmental lever in Africa, as in the rest of the Global South. The general contention of this paper is that African MNOs' zero-rating of over-the-top (OTT) services, limited as this practice is at present, can usefully provide a gateway to the Internet for first-time and price-sensitive users. Additionally, when the practice is deployed by non-dominant MNOs, zero-rating can enhance competition.

African MNOs' zero-rating practices raise the potentially negative unintended consequences that can arise from instrumentally regulating complex, adaptive systems that today drive innovation within the information and communications technology (ICT) ecosystem in Africa.

A user of zero-rated Wikipedia Zero via an African MNO, for example, has unlimited, no-cost access to everything in the online encyclopedia. Providing this kind of free access to popular, useful content and services is preferable, from an access-to-information and access-to-knowledge perspective, to practices that restrict access or prevent access entirely. Such zero-rated access also has the potential to drive demand for general-purpose mobile Internet access that can, in turn, stimulate demand for paid MNO data services and fund investment in infrastructure.

This paper also urges cognisance of the fact that zero-rating is not a new phenomenon. Zero-rating and other discounting practices have been present for as long as liberalised mobile telecommunications markets have existed.

Zero-rating is viewed by some as fostering discrimination among providers of online content and content applications in ways that may skew incentives for low-income/poor subscribers, such that users may choose to access the "free" services of identified partners instead of the services of competing providers. And to some advocates, such preferential treatment challenges fundamental principles of net neutrality. Net neutrality advocates argue that zero-rated services such as Facebook's Free Basics (formerly Internet.org) create "walled gardens" that limit access to, and use of, the "free and open" Internet. However, if the limited data provided by Facebook (2015) are accurate indications, it

may be that zero-rated services provide, to some extent, a gateway to the open Internet. Facebook claims that 50% of Internet.org/Free Basics users move on to use some paid data service within a month of using the free service for the first time (Internet.org, 2015a).

Another critique of zero-rating is that it can constitute an anti-competitive practice in the application development market. The argument is that zero-rated services create barriers to entry for emergent developers of apps and platforms, who struggle to compete against globally dominant apps and platforms that are zero-rated. The result, it is argued, is an increasingly un-level playing field, under conditions that are already unfavourable, even without zero-rating, to small and/or localised players. There appears to have been some effort to address this problem by Facebook, through its inclusion in Free Basics of local apps of public interest – e.g., health, local news, and culture apps (Access, 2014; Access, 2015; EFF, 2016; Public Knowledge, 2015). And it must be acknowledged that social networking platforms, Facebook in particular, are the main drivers of Internet take-up on the African continent – apparently regardless of whether or not the platforms are zero-rated (Stork *et al*., 2013).

In our view, a key weakness of the net-neutrality critique of zero-rating in the African mobile Internet context is that it prioritises the technical principle of network neutrality over other key public interest principles such as universality and equity (i.e., equity of content access; not equity of technical service provision in this context). Born in the rich world, the net-neutrality principle was initially – and is still – applied to ensuring equivalent technical quality of service to everyone who accesses the Internet. Equivalent technical quality of service is ensured by preventing Internet providers from practicing positive pricing discrimination in their network management, i.e., from giving superior bandwidth to content from providers willing to pay a premium for a higher quality of service. In the African MNO context, applying the net-neutrality principle to zero-rating could affect entry to, and use of, the Internet. This is because, in African countries where affordable access is the main factor inhibiting Internet take-up, and where even cost-based prices may be unaffordable to many, zero-rated services may provide access to the Internet that would not otherwise be acquired. In addition, the net-neutrality critique of zero-rating in the mobile prepaid environment tends to conflate different potential competitive outcomes for the diverse players/elements in that environment.

Our contention is that in the African context, where it is the mobile market that is providing access for the majority of Internet users, regulators should not prohibit the zero-rating of products when the zero-rating is found to be competition-

enhancing, i.e., zero-rating should be allowed to the extent that it does not establish or entrench anti-competitive practices or long-term dominance in a market. And when found to have anti-competitive outcomes, African MNO zero-rating practices should be subjected to policy and regulatory remedies to address the outcomes at the level at which they occur, i.e., in relation to the relevant player/element. Anti-competitive outcomes generated by zero-rating should not be addressed via blanket banning, or restrictions that impact several levels, because such regulatory actions are likely to result in unintended, unfavourable consequences.

Detailed understanding, generated by Research ICT Africa (RIA) data collection, of the African prepaid mobile market and pricing of MNO products across markets, shows that zero-rating is but one of multiple short-term strategies used by operators, particularly late entrants, to grow market share. If most users of zero-rated OTT services did not eventually adopt paid data services, it would not make sense for the African MNOs that zero-rate services to continue doing so. Although it is difficult to determine, there is some indication from the available Facebook data and big data in the African prepaid environment that users of free data do in fact migrate to using paid data (Internet.org, 2015a).

The key research – and indeed policy – issue underlying this paper is the extent to which African MNO zero-rating strategies for OTT services produce pro-poor outcomes, i.e., the extent to which these strategies enhance affordable access to the Internet. In addressing this question, this paper draws on a combination of the limited empirical fragments in the debate on zero-rating and the extensive pricing data collected across 50 African countries by RIA.

BACKGROUND

Many Africans access the Internet for the first time through a mobile phone. Research ICT Africa (RIA) surveys have found that mobile phones, and social media applications on them such as Facebook Zero, Opera Mini, and the now-defunct MXit in South Africa, have become major drivers of Internet uptake (Stork *et al.*, 2013). The nationally-representative 2011-12 RIA Household and Individual ICT Access and Use Survey showed that in South Africa, Kenya and Nigeria, users were not only most likely to access the web for the first time on a mobile phone, but also that they were most likely to do so in order to use a social media platform such as Facebook (RIA, 2012). This 2011-12 finding contrasted with the finding in the earlier RIA ICT Survey of 2007-08, which found that the most likely method of accessing the Internet was via a laptop or desktop computer, and the mostly likely reason was to send an e-mail (RIA, 2008).

The International Telecommunication Union's (ITU's) most recent data, from 2015, placed South African Internet usage at 51.9% of the population (ITU, 2015). The ITU's user figures were even lower for Kenya, at 45.6%, and Nigeria, at 47.4% (ITU, 2015). These figures indicate that huge numbers of Africans have yet to go online at all, much less become full participants in the Internet economy. And while there is increased availability of low-cost smart devices,

data costs are still a significant blockage, with the RIA 2011-12 Survey finding that price of data remained a major barrier to Internet take-up in most African countries (RIA, 2012).

Local market forces make Facebook's Free Basics (formerly Internet.org) and other zero-rated over-the-top (OTT) services more appealing in most African nations than they are in countries where a greater share of the population already has affordable access to the Internet and is already using the full-service OTT offerings. The limited available data from Facebook suggest that some users may in fact be using the Internet for the first time via Free Basics (Internet.org, 2015a). However, it must be acknowledged that in African prepaid mobile environments, which are characterised by multiple-SIM ownership and SIM-swapping, and in which there is little accurate demand-side data publicly available on user behaviour, it is impossible to say definitively who is accessing the Internet for the first time using zero-rated services, or whether, when a user moves beyond the zero-rated product into the wider Internet, the user is doing so for the first time. Big data from mobile network operators (MNOs) can only tell us about the activity on a particular SIM or device.

From a policy and regulatory perspective, the issue of zero-rating of OTT services in Africa highlights:

- the convergence of the once-distinct policy and regulation domains for infrastructure and for content;
- a clash of cultures between the world of the Internet and that of older telecommunications and communications platforms; and
- the complexity of competition regulation in new information and communications technology (ICT) sectors.

The European telecommunications sector has sought for over a decade, in international fora, to have OTTs regulated, e.g., to have OTTs prohibited, or forced to pay to run on top of telco networks. For example, in 2012, the European Telecommunications Network Operators' Association (ETNO), a Brussels-based lobby group representing companies in 35 European countries, proposed that the ITU designate Internet content providers as "call originators" and subject them to a "sending party network pays" rule that would allow telecommunications operators to charge OTTs rates they believe are commensurate with the bandwidth their content consumes (ETNO, 2012, cited in Samarajiva, 2012).

The question of whether zero-rated OTTs should be regulated has been bubbling since the start of the Internet, along with questions of whether and how the Internet should be regulated. If zero-rated OTTs are to be regulated, then how? For a long time, the argument seemed to hold that OTTs were simply a higher layer on existing networks and could not be separated out and defined as a competitive service. It was really only when the offer of zero-rated "free" OTT voice services came to be widely utilised by consumers – i.e., when telcos' voice revenues began to be more severely undermined by OTTs – that the telcos started to actively seek to have OTTs banned or to have telcos compensated for their losses.

In Africa, although bans on OTT VoIP (voice over Internet protocol) services (e.g., Skype) have existed, and continue to exist, in many countries, the VoIP threat to African telcos remained relatively contained for as long as Internet penetration remained low. The VoIP user segment in African countries was, until relatively recently, a small, elite segment of PC owners making use of high-cost connectivity. Today, however, the potential for masses of African users to move from paid MNO voice and text services to zero-rated (or heavily discounted via bundling, add-ons, rewards) OTT voice and text apps (e.g., WhatsApp) – enabled by growing mobile broadband Internet penetration – is driving certain African mobile and fixed-line incumbents to push for policy-regulatory protection. Incumbents have seen with alarm that later entrants into African national MNO markets, who struggle to gain voice subscriber market share, are on a more equal footing in the newer, less-entrenched mobile Internet data market, and can make significant subscriber gains through zero-rating or heavy discounting access to OTTs.

ZERO-RATED SERVICES

The term zero-rating, for the purposes of this Africa-focused paper, refers to African MNO offerings that enable mobile data customers to download and upload certain online content without incurring data usage charges or having their usage counted against data usage limits (Eisenach, 2015). Zero-rating thus allows mobile subscribers to access certain online content "for free".

For advocates of the principle of net neutrality (a principle only developed in the Internet era), zero-rating practices violate the principle because they allow operators and content providers to discriminate, i.e., to treat certain content, applications or services differently (and more favourably in terms of encouraging customer usage) from others. In reality, the practice of zero-rating of services and products has been a longstanding practice in liberalised mobile telecommunications markets, generating little to no controversy and forming an intrinsic part of the competitive strategies of suppliers and operators – first with SMS, then MMS, Blackberry Messenger, WAP services and, since the advent of Internet-enabled smartphones, with smartphone subscriptions (Layton & Elaluf-Calderwood, 2015). "Operators don't deploy zero-rating because they can, but because they must", Baumol wrote in 2002 (as quoted in Layton & Elaluf, 2015, p. 37). Services

often zero-rated by content application providers (CAPs) and MNOs for users in the Global South include Facebook, Google, Twitter, and messaging apps such as WhatsApp (EFF, 2014).

Table 1 below provides a summary of zero-rated Facebook Free Basics and Wikipedia Zero OTT offerings in the four countries that are the focus of this paper: Ghana, Kenya, Nigeria and South Africa. (At the time of the data collection for this paper, in late 2015 and early 2016, Airtel Nigeria had not yet launched its zero-rated Free Basics product, which became available in April 2016).

Platform / Offering	Who subsidises consumer?	Content	Study countries where offering is present	MNO service provider	Service provider market position
Facebook's Free Basics (formerly Internet.org)	Subsidised by the MNO (Facebook does not pay carriers to zero-rate access and does not receive payments from carriers)	Facebook Zero (a reduced-functionality version of Facebook): a mix of public interest websites, including sites of governments, non-governmental organisations and businesses, e.g., Smartbusiness, Girl Effects, BBC News	Ghana Kenya South Africa	Airtel Airtel Equitel Cell C	Non-dominant Non-dominant Non-dominant Non-dominant
Wikipedia's Wikipedia Zero	Subsidised by the MNO (Wikimedia Foundation does not pay carriers to zero-rate access and does not receive payments from carriers)	Access to the regular mobile version of Wikipedia and other Wikimedia sites in all languages	Ghana Kenya South Africa	MTN Safaricom Airtel Equitel MTN	Dominant Dominant Non-dominant Non-dominant Dominant

Table 1: Presence of fully-zero-rated OTT offerings in Ghana, Kenya and South Africa

Source: Authors

NET NEUTRALITY

Net neutrality is the principle that all electronic communication passing through a network is treated equally, independent of the nature of the content, application, service, device, sender address or receiver address (GSR, 2012). According to the logic of net neutrality, any discriminating, blocking or throttling of content or applications requires a regulatory response, in order prevent such behaviour going forward. In regimes such as the US where net neutrality is enforced, regulators require Internet service providers (ISPs) to have transparent traffic management techniques. Writing in the US context in support of the pro-net-neutrality stance of that country's regulator, the Federal Communications Commission (FCC), Van Schewick (2012) states:

> If ISPs can charge application providers to be zero-rated, they would have an incentive to lower monthly bandwidth caps or increase the per-byte price for unrestricted Internet use in order to make it more attractive for application providers to pay for zero-rating. (Van Schewick, 2012)

Indeed, Digital Fuel Monitor has documented zero-rating by developed-world ISPs' of their own "data-hungry" on-demand film stores and mobile TV, and their linked practice of either lowering the maximum amount of bandwidth users can purchase or increasing prices for data usage (Digital Fuel Monitor, 2015).

At present in the African mobile data context, the dynamics of zero-rating are quite different from those observed in the Global North. In Africa, as seen in Table 1 above, it is the operators, not the content providers, picking up the costs of zero-rating. Global social-networking platforms such as Facebook's Free Basics are clearly seen by African MNOs as sufficiently attractive to African audiences for the MNOs to picking up the data costs of such platforms, either for a fixed period of time or indefinitely.

The principle of net neutrality was traditionally applied to ensuring equivalent technical quality of service to everyone accessing the Internet, i.e., by preventing positive pricing discrimination. Applying the net-neutrality principle to zero-rating of OTT services – i.e., applying the principle in opposition to negative pricing discrimination in relation to content – takes the principle out of the realm of technical regulation into the realm of content regulation, thus seeking to give the principle relevance to elements of competition regulation in both the technical and content realms.

In African countries where affordable access is typically the main factor inhibiting Internet take-up, and where even cost-based prices are often

unaffordable to many, zero-rated services may provide access to the Internet that would not otherwise be acquired. Facebook's data (Internet. org, 2015a), though limited, suggest that, globally, 50% of Free Basics users move on to use some form of paid data service within a month of using Free Basics for the first time – a suggestion that zero-rated services may help provide a gateway to Internet use. It must be noted, of course, that Facebook data are not independently verified, and that the nature of African mobile prepaid markets (characterised by multiple-SIM ownership and SIM-swapping) makes user behaviour difficult to track based on big data, e.g., perhaps the person accessing the Internet on one particular SIM card for the first time had previously accessed the Internet on another SIM.

Arguments calling for limitations or bans on OTT zero-rating on the grounds that it infringes the principle of net neutrality are potentially letting the net-neutrality principle trump other, potentially more important public interest principles, e.g., principles of universality and equity (in this case equity of content access, as opposed to equity of receipt of technical quality).

INTERNATIONAL POLICY-REGULATORY TRENDS

Most African countries, which tend to follow European Union (EU) regulatory trends rather than those of the US, have been slow to develop positions on net neutrality, with the EU itself only adopting net neutrality rules late in 2015 (EU, 2015). Under the EU rules, blocking, throttling or discrimination of Internet traffic by ISPs is prohibited, with national regulatory authorities tasked with keeping an eye on their markets for any such developments. The EU rules call for all traffic to be treated equally, on the grounds that "[e]qual treatment allows reasonable day-to-day traffic management according to objectively justified technical requirements, [...] independent of the origin or destination of the traffic and of any commercial considerations" (EU, 2015).

Although the debate on net neutrality has been before the US regulator, the FCC, since the 1990s, it was only in 2015 that the FCC published a Final Rule on the matter, entitled Protecting and Promoting the Open Internet, with the regulations going into effect in June 2015 (FCC, 2015a). The FCC rules prohibit ISPs from using pricing models based on the user's quality of service, i.e., ISPs are prohibited from providing a multi-tiered service through discriminatory pricing. Earlier in 2015, the FCC had made clear its support for net neutrality by reclassifying broadband as a "common carrier" under the national telecommunications law (FCC, 2015a).

Recent reviews have shown that limitations on zero-rating also exist in Canada, and in Chile, which was the first Latin American country to take such a step (Layton & Elaluf, 2015). In the Asia-Pacific, India has been a strong follower of US developments on net neutrality, and in February 2016, after a lengthy public consultation that included a one billion-signature campaign organised by net neutrality advocates, the Indian regulator, the Telecom Regulatory Authority of India (TRAI), issued the Prohibition of Discriminatory Tariffs for Data Services Regulations (TRAI, 2016a). This Prohibition prevents data providers from offering or charging discriminatory tariffs for data services on the basis of the type of content being accessed by a consumer (TRAI, 2016a). In a press release accompanying the regulations, TRAI stated that;

[w]hile formulating the Regulations, the Authority has largely been guided by the principles of Net Neutrality seeking to ensure that consumers get unhindered and non-discriminatory access to the internet. These Regulations intend to make data tariffs for access to the internet to be content agnostic. (TRAI, 2016b)

TRAI concluded that ex-ante (i.e., before the event) regulation, rather than a case-by-case ex-post (i.e., after the event) tariff intervention regime, would be more appropriate in dealing with zero-rating, as it would give "much needed certainty

to industry participants" (TRAI, 2016b). TRAI also indicated that such a step was warranted in view of the high regulatory costs, in terms of both time and resources, which would have been generated by investigating each case of suspected tariff discrimination.

The US-based Electronic Frontier Foundation (EFF) continues to advocate for outright banning of zero-rating in the US and globally (EFF, 2014). According to a coalition of public interest groups (including the EFF) that lobbied the US FCC following its aforementioned 2015 net neutrality ruling, the largest ISPs in the US have been undermining FCC's Open Internet rules by practicing zero-rating, and are, among other things, disproportionately harming poor people (EFF, 2015). Zero-rated plans, the coalition contends, "distort competition, thwart innovation, threaten free speech, and restrict consumer choice – all harms the [FCC Open Internet] rules were meant to prevent" (EFF, 2015). According to the coalition, "[t]hese harms tend to fall disproportionately on lowincome communities and communities of color, who tend to rely on mobile networks as their primary or exclusive means of access to the internet" (EFF, 2015). (Better-resourced Americans tend to primarily consume Internet through fixed-broadband access in homes and offices). US opponents of zero-rating (such as the EFF, Public Knowledge, and Access) equate it to "fast lane discrimination" (FCC, 2015b).

In African and other developing-world markets, zero-rating has to date evolved differently from its evolution in the Global North. As seen above in Table 1, so far in Africa (as in much of the developed world) it has been the MNOs, not CAPs, picking up the costs of zero-rating OTT apps and services. And Table 1 also showed that often it is not a dominant incumbent MNO, but rather a non-dominant later entrant, that is providing zero-rated access in African markets – in a clear attempt to differentiate itself in the market and capture market share.

Table 2 below provides a summary of some of the policy-regulatory approaches being taken in relation to zero-rating in various part of the world.

Zero-rating serves different interests for different components of the Internet value chain. There are now a number of studies that demonstrate that zero-rating can be an economically efficient mechanism for increasing consumer welfare (see Baumol & Swanson, 2003; Eisnach, 2015; Varian, 1996, cited in Eisnach, 2015).

Layton and Elaluf-Calderwood (2015) provide a mixed appraisal, finding evidence that operators who zero-rate their own content may foreclose other content, but also evidence that users of zero-rated services tend to go beyond zero-rated content to paid-for services. And they find that zero-rated content generally appears to be non-rivalrous, i.e., its presence or use by those who wish to use it does not detract from the experience of other users

(2015, p. 31). Layton and Elaluf-Calderwood (2015) also make the point, as has been made in relation to India's decision to ban zero-rating, that the goal of groups such as Public Knowledge and other advocates of a ban on zero-rating (in submissions to the FCC and in lobbying internationally) is for users to get uncapped (or high-capped) flat-rate Internet subscriptions. But flat rates, no matter how low, have to meet the threshold level of average users. This tends to work in favour of high-volume users, meaning that low-volume users effectively subsidise the high-volume users.

Eisenach's study (2015) argues that given the current characteristics of information technology markets, in which operators are driving down prices in order to expand market share (especially in developing countries where incomes are low), zero-rating programmes generally can serve as economically efficient means for increasing consumer welfare. Eisenach concludes that "while regulatory authorities should remain vigilant in monitoring business practices, broad-based bans or restrictions on Zero Rating plans are far more likely to harm consumer welfare than improve it" (2015, p. 1).

Policy-regulatory approach	Key elements	Countries adopting approach
Strict regulation	• All Internet data considered/treated as being equal • Regulations to prohibit discrimination, prioritisation, blocking, and/or throttling of Internet data • No "gatekeepers" at network, content or application levels	Chile, Netherlands, Brazil, Slovenia, India
Moderate regulation	• Open Internet with degree of flexibility for operators • Anti-trust or ex-post regulation (case-by-case evaluation)	US, EU
Self-regulation	• Industry code of practice and net neutrality	UK, Sweden, Japan, Switzerland
No regulation	• Market dynamics decide • Wait-and-see regulatory approach	Ghana, Kenya, Nigeria, South Africa (and most other African countries)

Table 2: Policy-regulatory responses to zero-rating

Source: Prepared by Walubengo

PRODUCTS AND PRICING

The prepaid data products offered by African MNOs are complex, with zero-rated products representing a very small proportion of the available offerings. Recent RIA research found that MNOs in 24 African markets were offering combined-service top-ups, inclusive of data, in order to compete with zero-rated services (Chair & Stork, 2015). Combined-service products bundle various combinations of voice, text and data together (Stork *et al.*, 2016). The operator sets the price of the top-up so that ensures the desired average revenue per user (ARPU) and, in return, the operator provides close-to-unlimited use of one or more services. Stork *et al.* (2016) argue that these prepaid combined-service products are examples of flat-rate pricing, which can be a successful strategy to retain revenues. Meanwhile, fully-zero-rated MNO OTT offerings are not yet widespread in Africa, and are typically being offered by newer entrants seeking to gain market share.

The RIA African Mobile Pricing (RAMP) Index (RIA. n.d.), groups prepaid packages into the following four categories:

- prepaid voice and SMS;
- prepaid data;
- prepaid top-up (single-service or combined-service); and
- rewards.

RAMP classifies zero-rated services as a prepaid data type, though one must note that zero-rated services may also be offered on contract plans.

RAMP classification of prepaid products is based on observations across 48 African national markets. Terminology referring to product types varies according to the countries and operators, and thus the RAMP framework is adjustable. Table 3 summarises the four categories of products and provides examples. It is not possible to measure or compare, with full accuracy, the cost of top-up packages or rewards plans, as the costs are determined by the operator on the basis of other underlying plans or arrival at usage thresholds.

Package category	Package type	Package features	Examples
Prepaid voice and SMS packages: initial voice and SMS tariff plans that subscribers get when they join a network	Tariff plans associated with SIM card	Automatically join default plan on SIM with associated rates	Buy a line and automatically qualify for a USD0.60 per minute calling rate and USD0.05 per SMS tariff plan
	Tariff plans one can migrate to	Migrate to another plan on same network with different tariffs or product features, e.g., dynamic pricing or friends and family tariffs	Migrate to new plan with a USD0.50 per minute calling rate, or a USD0.25 per minute rate for calls to friends and family
	Tariff plans with bundle services	Pay for bulk minutes and/or SMS on a specific plan	Buy bulk minutes and/or SMS at a once off price, and other tariffs remain constant
Prepaid data packages: data-only plans that may either be zero-rated, bundled data, or unlimited data (all three package types in this category are characterised by the quantity or volume that the user purchases and the expiry date of the bundle purchased, i.e., validity)	Zero-rated data: applications or services that do not carry a data charge to the user.	Applications or services that do not carry a data charge to the user's data package	Zero-rated Free Basics or Twitter
	Bundled data: data cost discounted by volume where the higher the volume the lower the in-bundle data rate	Data discounted by volume with validity that is daily, nightshift (between midnight and 5am), weekly, monthly or yearly	Buy once-off 100MB of data
	Unlimited data: Unlimited data on a prepaid product	Pay for unlimited internet access for a set period	Unlimited internet for 30 days for USD20
	Single-service top-up: buying bundles of either minutes, SMS, data, or application data	Services sold in bundles of minutes, SMS, data or for an application	Buy data for minutes or for WhatsApp use only
	Combined-service top-up: user buys a combination of two or more services, without a breakdown of how much each service costs (combined services were observed in African markets as a response to OTT services)	Combination of voice, SMS, data or application, e.g., minutes + data; SMS + data; minutes + SMS + data; minutes + SMS + data + application	Buy 100MB data + 100 call minutes + 100SMSs + 100MB for social media (or unlimited data for social media)
Prepaid top-up packages: services that one has to buy on top of an already existing tariff plan	Single-service top-up: buying bundles of either minutes, SMS, data, or application data	Services sold in bundles of minutes, SMS, data or for an application	Buy data for minutes or for WhatsApp use only
	Combined-service top-up: user buys a combination of two or more services, without a breakdown of how much each service costs (combined services were observed in African markets as a response to OTT services)	Combination of voice, SMS, data or application, e.g., minutes + data; SMS + data; minutes + SMS + data; minutes + SMS + data + application	Buy 100MB data + 100 call minutes + 100SMSs + 100MB for social media (or unlimited data for social media)
Rewards plans: based on activities the user does that qualifies the user for a reward from the operator, extra data, extra SMS or airtime credit.	Airtime or service reward: based on a user recharging a certain amount, or using a certain amount, for which they receive extra voice calling minutes	For a certain amount recharged or used, one receives extra minutes, SMS, data or airtime credit	Recharge USD50 and get 150MB or USD100 of data before they have used the airtime for a service
	Points reward: based on a certain amount recharged or used on a prepaid plan, a customer can receive points that can be used to redeem other services	For a certain amount recharged or used on a prepaid plan, a customer can receive points that can be used to redeem other service	For every USD10 spent, the customer receives 1 point. Once a customer gets 100 points, she or he can redeem the points for voice, SMS or data

Table 3: Four African prepaid product categories

Source: RIA African Mobile Pricing (RAMP) Index (RIA, 2015)

Ghana

GHANA'S ICT SECTOR AT A GLANCE

Ghana remains one of the most promising ICT markets in sub-Saharan Africa, but it performs poorly when ranked in global indices. The 2015 ITU ICT Development Index (IDI) ranked Ghana 113th out of 166 countries in 2015, only a slight improvement on its position of 115th in 2012 (ITU, 2015). Yet Ghana performs consistently well on the RIA African Mobile Pricing (RAMP) Index. It was ranked the sixth-lowest-cost country in the RAMP Index in the first quarter of 2016, out of 48 countries, based on RIA's mobile price basket. RIA's RAMP Index makes use of the Organisation for Economic Co-operation and Development (OECD) 30-call price basket, which is weighted at a total of 50 calling minutes per month and 100 SMSs per month (OECD, n.d.). But unlike the OECD, which only examines prices of dominant operators in each market, RIA collects data for all operators in each market (RIA, 2015).

Ghana's favourable position in the African context is also reflected in the results of a survey conducted by the Africa Business Panel in 2013 (KPMG, 2013), which found that Ghana is set to become a major player in the African ICT sector in the coming years. The Panel, based on surveying the views of 80 countries, ranked Ghana's ICT sector at 4th on the continent, after South Africa, Nigeria and Kenya (KPMG, 2013).

The Ghanaian ICT market continues to grow aggressively in all segments, particularly in the mobile telecommunications sector where penetration rates are

Table 4 provides some key Ghanaian ICT sector indicators.

Indicator	Figure
Mobile phone penetration in 2015	127.63 % of population
Mobile data subscribers in 2015	65.74 of population
Fixed broadband internet penetration in 2013	0.3% of population
Fixed-line penetration in 2015	1% of the population
Avg. annual contribution of ICTs to GDP, 2009-2013	2%
Household ownership of desktop in 2013	6% of households
Household ownership of laptop in 2013	6.6% of households
Mobile phone ownership at a household level 2013	80.3% of households
Number of MNOs	6 operators

Table 4: Ghanaian ICT sector indicators

Source: NCA (2015a, 2015b, 2016), GSS (2014)

increasing rapidly. In 2012, Ghana's Internet speeds were, according to one report, the fastest in Africa (Dowuona, 2012a). Ghana's approach to building an ecosystem for Internet growth has focused on establishing network infrastructure and promoting government as an early adopter (Dowuona , 2012b).

According to the Ghana's ICT for Accelerated Development (ICT4AD) Policy of 2003 and the National Telecommunications Policy of 2005, the Ghanaian Government is mandated to create an enabling environment to attract investment and promote creation of a knowledge economy to advance economic growth and development (Republic of Ghana, 2003, 2005). These objectives are assigned to the Ministry of Communications, National Information Technology Agency, National Media Commission and National Communications Authority (NCA).

According to the World Bank's Data Development Group, as cited by the Ghana Investment Promotion Centre (GIPC), ICT infrastructure in Ghana is developing far better than most other low-income countries, and above the 1.1% average progress (measured in terms of investment in infrastructure) for sub-Saharan Africa (GIPC, n.d.). In addition to rapidly developing mobile network infrastructure, Ghana also has one of the highest fibre penetrations in the region, with five

international undersea fibre links (Telegeography, n.d.). Following the liberalisation of the telecommunication sector in 1994, government investment was reduced and private operators emerged. Multinational infrastructure investment increased as companies such as Helios Towers, American Towers Company, and Eaton Towers emerged in the Ghanaian telecommunications infrastructure space. There is also growing interest in the provision of infrastructure by providers such as Google's Project Link, Microsoft's Youth4Africa Project, and Facebook's Internet.org.

Between January 2013 and December 2015, mobile voice penetration increased roughly 12%, and mobile Internet penetration increased roughly 26% (NCA, 2013a, 2013b, 2014a, 2014b, 2015a, 2015b). Established providers of these services are MTN, Airtel, TiGO, Vodafone and Expresso. MTN is the dominant operator in both mobile voice and mobile Internet, with 47.24% and 49.25% of subscriptions respectively (NCA, 2016). An ISP, Surfline Ghana, became the country's 6th MNO in the last quarter of 2014, introducing 4G/LTE Internet services.

MOBILE OTT PROVISION IN GHANA

A recent GSM Association (GSMA) report, compiled by Deloitte, indicated that there are more Ghanaians opting for the use of OTT VoIP platforms such as Facebook, Viber, Tango and Skype to make calls in Ghana than there is use of direct mobile lines (GMSA, 2015b). Other reports indicate that small businesses, in particular, are adopting VoIP over mobile-to-mobile service (see GMSA, 2015b).

Ghana's MNOs offer low-cost data packages to encourage data consumption, mainly through single-service top-up bundles for usage of OTT apps such as WhatsApp, Facebook, Twitter, Viber and Tango. For example, at the time of the research for this paper in late 2015, the market leader, MTN Ghana, was offering a Social Bundle at GHC5[1] (roughly USD 1.26) for 30 days of use of Facebook, Twitter and WhatsApp. Each operator was offering packages targeted at users characterised as being primarily browsers of the Internet, or primarily live streamers, or primarily downloaders. At least four of the MNOs – MTN, Vodafone, Airtel and Surfline – were offering devices that enabled groups to access the Internet simultaneously through one account.

Despite Ghana's relatively positive rankings on pricing comparisons, both mobile voice and mobile data remain unaffordable for many low-income earners. Table 5 below shows industry averages for voice and data costs, and puts those costs in the context of the daily minimum wage at the time of this research (as set by the government of Ghana). With the daily minimum wage at approximately 7.93 GHS cents (approximately USD2), 5MBs of mobile data usage cost roughly 7.5% of the daily minimum wage, and 5 minutes of off-net voice calls cost almost 10% of the daily minimum wage. Thus the costs of mobile voice and mobile data are still significant for a large number of Ghanaians.[2]

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[1] GHS = Ghanaian Cedi

[2] 1.00 USD = 3.9 Ghana Cedi

Mobile service	USD cost	Cost as % of daily minimum wage
On-net voice (call to number on same network)	0.15 for 5 mins.	7.5
Off-net voice (call to number on another network)	0.2 for 5 mins.	10
Data	0.15 for 5MB	7.5

Table 5: Cost of mobile services and cost as % of minimum daily wage

Source: Compiled by author Koranteng from MNOs' advertised prices, from GSS (2014), and from UGBS (2016)

Table 6 below shows evolution in the country's mobile data access gap, i.e., the percentage of mobile voice/SMS subscriptions that do not include a data component.

As at the end of February 2016, 136 prepaid data products were identified as being on offer from Ghana's four largest MNOs MTN, Airtel, TiGO and Vodafone, with only one of those products being fully-zero-rated: Airtel's Facebook Free Basics offering.

Airtel began offering the Facebook Free Basics service (initially called Internet.org) in January 2015 (Mutegi, 2015). The Free Basics content, which consists of a scaled-down (non-graphical, non-video) version of Facebook and a variety of public-interest content such as employment, health, education and local information, is freely available without data charges. This Ghana launch was part of a joint Facebook-Airtel strategy whereby Airtel is to offer Free Basics in all 17 of the African countries where it operates (Airtel, 2015). Airtel Africa, headquartered in Kenya, claims its provision of Free Basics will bring more people online and help close the digital divide on the continent (Airtel, 2015).

2013 (Jan)	2013 (Dec)	2014 (Jan)	2014 (Dec)	2015 (Jan)	2015 (Feb)
69.4%	67.7%	61.1%	54.35%	55.25%	56.62%

Table 6: Percentage of mobile voice/SMS subscriptions excluding data

Source: NCA (2013a, 2013b, 2014a, 2014b, 2015a, 2015b), Telegeography, (2014)

Of the 136 prepaid data products found being offered by the four main MNOs:

98 bundled prepaid data packages;

37 plans were designed to allow consumers to access specific services or to access through specific devices (e.g., Blackberry, Alcatel, or Samsung devices); and 1 was the zero-rated Airtel Free Basics offering.

While Airtel's Facebook Free Basics was the only fully-zero-rated product identified, some of the bundled prepaid data products combined zero-rated elements together with paid elements, e.g., Vodafone's Double Data and Bonus Data, with "free" data earned for reaching a threshold or purchasing a product. Promotional rollover services were also being deployed, enabling customers to still have access to unused data even after a bundle's expiry, e.g., Airtel's Data Extender service and Vodafone's Data Rollover offering.

In addition to examining the MNO practices in relation to zero-rating of OTTs, we sought to assess the perspectives of consumers, the MNOs, government, and local ICT firms. To this end, we conducted interviews, engaged in stakeholder consultation, and relied on our Ghana researcher's insights into the country's ICT ecosystem.

Consumer outlook

Through random interviews with consumers, it was found that consumers saw the Internet as a background enabler, with Internet provision the responsibility of the provider, i.e., it was up to the provider to explore avenues for making the Internet affordable to the end user. The issue of zero-rating was found to be of no relevance to the consumers interviewed – a view reaffirmed by a response from the Ghana Telecommunications Chamber (GTC), who indicated "it is not a priority issue for the sector" (GTC representative, e-mail response, August 2015).

MNO outlook

MNOs' perspectives were captured during an August 2015 telecommunications stakeholder forum organised by the University of Ghana Business School, which brought together all players within the telecommunications industry with the exception of Expresso. The forum participants discussed the challenges and opportunities for sector growth for the next five to 10 years.

Sector representatives at the forum cautioned government and the regulator in respect of the profitability of the industry. Operators spend sizeable budgets on marketing and communications, and fulfilling their statutory payment obligations, e.g., taxes (see below) and payment of 1% of profit as a universal service and access levy to the government's Ghana Investment Fund for Electronic Communications (GIFEC). In addition, some of the costs of MNO operations have significantly increased in recent years due to the weakness of the Ghanaian currency in foreign exchange markets.

It was argued at the forum that the payback period for fixed-line infrastructure was 10 to 15 years, as

compared to one to three years for mobile services. Hence, the latter present a much more viable option. It was also stated that in the telecoms industry in Ghana, the tipping point for reaching profitability was 13-14% of market share, and that the minimum timeframe for reaching this point was four to five years after commencing operations. The sentiment among MNOs at the forum was that they needed to do, as one participant put it, "a little bit of everything", including offering zero-rated content, to stay ahead of the competition.

Government and regulatory outlook

Interviews were conducted with a GIFEC official and an NCA director. Ghana is ranked as one of the most highly-taxed countries in the region with respect to telecommunications. Telecom operators are subject to 14 different taxes and regulatory fees, in addition to various one-off charges. According to the GSMA (2015b), MNOs in Ghana currently pay a total of roughly USD650 million in taxes each year, representing about 40% of total revenues in the sector. Yet there is weak government investment in supporting vulnerable sectors within the ICT ecosystem, e.g., nascent IT firms. According to the GIFEC interviewee, "Government has no time to wait for your IT firm to grow; it has a limited mandate, which is time-bound. Hence any means it finds to increase its revenue, will certainly be the likely option" (GIFEC official, personal interview, September 2015).

The Government is offering very little in the way of tax breaks and sector investment to start-ups and indigenous firms seeking to compete favourably with foreign firms. The government appears to be focused on maximising revenue from the sector. The government is not creating the level playing field, mandated by the Ghana Telecommunications Policy (2005), which is necessary for local firms to grow. And with the exception of efforts by GIFEC to support universal service and access via funds levied on operators, the government also exhibits limited willingness to invest in support of the goal of countrywide Internet access.

Any initiative that expands affordable access – e.g., zero-rated Internet access – should present a buy-in opportunity for government. But the available evidence suggests that such opportunities are often overlooked by the state.

It can be assumed that zero-rated OTT services driven by powerful global CAPs such as Facebook, to the extent that such services emerge in Ghana, will be of major concern to Ghana's local CAP start-ups. Ghana is home to a number of innovation hubs and renowned IT start-ups. Several private technology business incubator spaces have emerged, notably iSpace, Accra Hub, Meltwater Entrepreneurial School of Technology (MEST-Ghana) and the tecHub at the publicly-funded Kwame Nkrumah Institute of Science and Technology (KNUST). One product of an incubator programme, Esoko online, provides texts messages about price and stock information to its users. The service is widely used in Africa – e.g., in Benin, Malawi, Zimbabwe and Mozambique – for agricultural purposes. Farmerline,

Cocoalink and VOTO Mobile are some of the other m-Agric platforms making inroads in the region. Another incubated technology business, Dropifi, is a customer engagement tool that was developed in the MEST-Ghana incubator and has since won several awards.

CONCLUSIONS AND POLICY RECOMMENDATIONS

There have yet to be any policy-regulatory steps taken on the issue of zero-rating of OTTs in Ghana. The following are some existing realities that are likely to affect how the issue evolves:

- irrespective of strong growth in the mobile sector, there is still a significant mobile data access gap that needs to be filled;
- mobile data services remain unaffordable for a large number of citizens;
- the country's fixed-line data infrastructure is minimal;
- the country's innovation and start-up space, one of the most promising in the region, could feel vulnerable to having its link to the local customer base undermined by globally dominant CAP players pursuing zero-rating models; and
- government leadership is at present lacking in respect of taking steps to ensure public-interest-oriented sector growth and conduct.

Under these circumstances, the following policy recommendations are made :

Access gaps

To complement the existing universal service and access support measures via GIFEC, government should lower the tax burden on MNOs and provide tax incentives for them to improve data access and affordability for marginalised groups and communities. In addition, perhaps CAPs benefitting from zero-rating (or substantial discounting) of their services by MNOs could contribute universal service and access funds.

Protection for nascent firms

Local Ghanaian ICT start-up businesses need access to the market and opportunities to grow. The proponents of network neutrality argue, among other things, that emerging start-ups will be crushed by zero-rated CAPs if appropriate policies are not instituted to protect the start-ups. Government leadership in terms of clear policy direction is important to ensure a balance between protection of indigenous firms and maintenance of an environment welcoming to investment from international players.

Inclusive growth strategy

It is necessary to have an inclusive ICT sector growth strategy that is sensitive to the motivations of various actors. It needs to be a broad-based approach that identifies and caters to the following: the market appetite of CAPs; the investment opportunities for MNOs; the access requirements of consumers; the need for market access by nascent firms; and the regulatory and revenue expectations of government. It needs to be an approach that empowers actors within an ecosystem, engenders growth, and is mindful of the implications of zero-rated services.

Kenya

KENYA'S MNO SECTOR

There are four operators in the Kenyan mobile market, composed of three MNOs (Safaricom, Airtel and Orange), and one mobile virtual network operator (MVNO), Equitel, which only recently joined the market and is focused on the lucrative mobile money sub-sector. According to 2015 data, Safaricom continued to lead the various segments of the Kenyan telecommunications sector, commanding over 67% market share in mobile voice, 63% in mobile data, and 72% in mobile money, as shown in Figure 1 (CAK, 2015b).

The sector regulator, the Communications Authority of Kenya (CAK), has been under intense pressure from stakeholders, both in the public and private sectors, to declare Safaricom a dominant player. Various policy, regulatory and pro-competition interventions (including licensing additional mobile operators, introducing mobile number portability, and regulating mobile termination rates), coupled with aggressive operator price wars, have reduced Safaricom's dominant position in the mobile voice market, from over 80% to 67%, but it nevertheless remains in a position to act anti-competitively.

At the time of the research, the CAK had not taken any steps in respect of regulation of MNO zero-rating of OTT services. In the words of the CAK
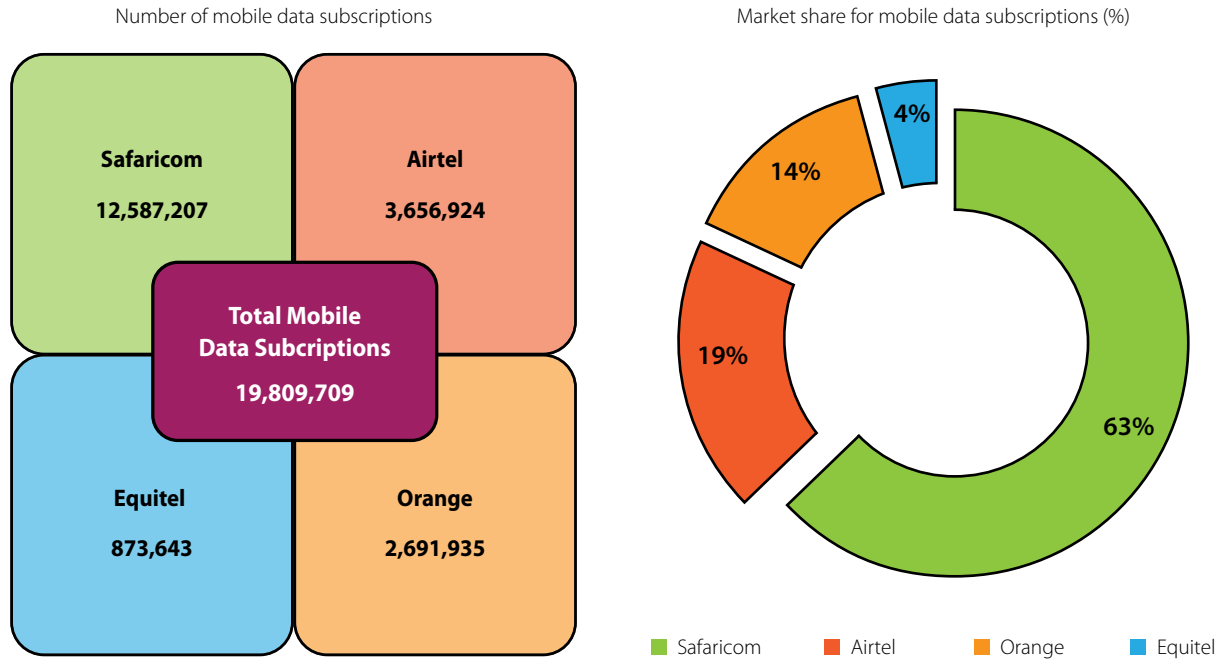
Figure 1: Mobile data subscription numbers and percentages

Source: CAK (2015b)

Director of Licensing, Compliance and Standards, when interviewed for this research:

> I would hesitate to propose floor-price-capping and instead advocate for fair competition frameworks such as safeguarding against cross-subsidisation and predatory pricing. This would, however, require heavy regulatory inputs in undertaking detailed audits, especially considering that some of these players are multinational in nature. (Chris Kemei, personal interview, 2016)

This cautious, non-interventionist approach is also evidenced in Table 7 below, which shows that three of the mobile operators in Kenya are offering fully-zero-rated data plans.

ZERO-RATING OPPONENTS

Kenyan net-neutrality proponents, mainly civil society activists, have voiced their critiques against MNO zero-rating practices, viewing them as potentially anti-competitive (Kivuva, 2015). Kenyan net neutrality

proponents further argue that zero-rating introduces centralising tendencies that insert "gatekeepers" into an otherwise open and free Internet ecosystem. Such gatekeepers, it is argued, will decide who connects to which content, as well as how they connect. The walled-garden concept is used to describe this situation (Gillula, 2015). This view also holds that the walled garden dynamic restricts and distorts what the Internet is for first-time users – by promoting (and in turn misrepresenting) a select menu of applications as being what constitutes the Internet (Mirani, 2015).

ZERO-RATING PROPONENTS

The content providers and telecommunications operators making use of zero-rating pose the counter-argument that they are not against the open Internet or net neutrality per se. They say they are, rather, against strict interpretation of the same. For example, the global mobile operator body the GSM Association (GSMA, n.d) argues that network traffic must be managed, because of finite and limited network capacities, and in order to provide effective, differentiated services for a differentiated consumer market. The Corporate Affairs Director at Safaricom, when interviewed for this research, said that traffic management, by design, discriminates among traffic types (content, application, service) and, accordingly, should be allowed as long as it is done within an acceptable range of quality of service (Steve Chege, personal interview, 2016). The Director of Marketing at

Airtel Kenya, also interviewed for this research, stated that offering free content was simply a way of enticing subscribers to make use of their data-enabled phones (Levi Nyakundi, personal interview, 2016). He argued that a large majority of Airtel's subscribers had a data-enabled smartphone but a sizeable number of the smartphone users still did not access data services.

According to this counter-argument, strict adherence to net neutrality principles would deny operators the ability to manage their networks, and would, simultaneously, diminish the flexibility they require to reach differentiated market segments, including lower-income groups.

CONTENT APPLICATION PROVIDER (CAP) VIEWS

In response to the contention that zero-rated content is harmful to competition, Facebook Africa's Head of Policy, Ebele Okobi (2015) argues that most zero-rated initiatives are "carrier-initiated" and that CAPs are not covering the cost of it. Accordingly, the operators' will only stand to significantly benefit once a subscriber to a zero-rated plan graduates to non-zero-rated, paid-up, full Internet content. In a long and spirited defence of zero-rated content, Okobi points out that the list of content provided to MNOs for inclusion in zero-rated Facebook Free Basics offerings is not exclusive and keeps growing (Okobi, 2015). Facebook's argument is that by allowing small content providers to reach larger markets via inclusion in Free Basics, zero-rating

increases competition in the content market segment. Okobi also positions zero-rating as stimulating, and providing a stepping-stone to, Internet uptake by individual users (Okobi, 2015).

OPERATOR PRACTICES

MNO zero-rating practices in Kenya need to be seen within the context of other data plans not adhering to full net neutrality that have been offered by operators for quite some time without significant resistance from either the regulator or proponents of net neutrality. For example, Kenyan mobile operators have single-service top-up bundles, such as Safaricom's BigBox, that allow customers to access broadcast (TV/radio) content on their mobile devices. For this to be practically and economically offered, the operator must violate strict net-neutrality principles, since the operator identifies

and discriminates favourably towards the broadcast traffic in order to prioritise its delivery for a specific segment of consumers. In addition, operators in the Kenyan market have for quite some time offered packages in which one or more of the services is zero-rated, e.g., both Airtel and Orange offer combined-service top-up packages with zero-rated components.

Table 7 below maps the diversity of data products on the prepaid Kenyan market. Zero-rated content varies but is mainly built around flagship CAP content such as Facebook's Free Basics and/or Wikipedia's Wikipedia Zero. The dominant operator, Safaricom, has apparently not yet felt the strategic imperative to sign onto Facebook Free Basics, while its competitors have. It appears that Safaricom's competitors see the Free Basics initiative as a strategic opportunity to increase their data subscribers and market share.

Type of prepaid data package	Operator			
	Safaricom	Airtel	Orange	Equitel
Bundled data	YES	YES	YES	YES
Single-service top-up	NO	YES Airtel Unliminet	YES Facebook BilaNet	YES Free Mobile Money
Combined-service top-up	NO	YES Airtel Unliminet Airtel Tosh bundles	YES Holla Kenya	
Rewards plan with zero-rated component(s)	YES Bonga Points	NO	NO	NO
Fully-zero-rated data offerings	YES Wikipedia Zero	YES Wikipedia Zero and Free Basics	NO Wikipedia Zero only as part of a bundle purchase	YES Wikipedia Zero and Free Basics in MyLIFE

Table 7: Prepaid mobile data package types in Kenyan market that have zero-rated elements

Source: Operator websites

ZERO-RATED ELEMENTS

Free Basics

With the scaled-down Free Basics version of Facebook, each operator selects among the additional zero-rated content options offered by Facebook's Internet.org to mount alongside the Facebook platform (Facebook for Developers, n.d.). The Equitel MyLife product, for example, offers, in addition to scaled-down Facebook, free access to financial data, since Equitel's core business is banking. Airtel's offering provides health information and selected news. Orange provides only the Facebook content on its Facebook BilaNet product (Gicheru, 2013; Sambuli, 2015). It must be noted that the Orange Free Basics offer (Facebook BilaNet) is not fully-zero-rated. Orange's Value-Added Service Manager, interviewed for this research, pointed out that BilaNet users had to subscribe to a minimal daily, weekly or monthly fee before accessing Free Basics (Marilene M Gaya, personal interview, 2015). The Orange interviewee also reported that only about 3% of its subscribers used this service, which is largely targeted at customers without smartphones, i.e., at those with feature phones (Marilene M Gaya, personal interview, 2015).

The Airtel interviewee stated that his operator's Free Basics offering targeted the 32% of its customers who had smartphones but were not actively using data or Internet services. Through access to free data, this group of users would have an opportunity to experiment and eventually embrace paid Internet services, and Airtel found that about 15% of the free-data users migrated to paid Internet services within a period of three to six months (Levi Nyakundi, personal interview, 2016).

Wikipedia Zero

The offering of Wikipedia Zero content is more standardised across the Kenyan MNOs, perhaps because of Wikimedia's self-declared non-exclusive operating principles (Wikimedia Foundation, n.d.). Most of Wikimedia's principles for Wikipedia Zero, such as "[n]on-exchange of payments", "[n]on-exclusive rights", and "on-editorial control by operators", try to align themselves to traditional open Internet principles (Wikimedia Foundation, n.d). Wikipedia Zero requires MNOs to give all users the same quality of access to Wikipedia, irrespective of whether the product is zero-rated or not.

CONCLUSIONS AND RECOMMENDATIONS

MNO OTT zero-rating in Kenya comes in the form of both fully-zero-rated products and partially-zero-rated products, e.g., paid plans with zero-rated components. Accordingly, zero-rating is not a straightforward issue in policy-regulatory terms. Kenya's present no-regulation, wait-and-see approach is probably the safest policy position

to adopt. But at the same time, it is imperative that the Kenyan regulator, the CAK, institute mechanisms to collect relevant data from operators, in order to inform future policy directions on the matter. For example, it is important to generate supply-side data relating to how many Free Basics subscriptions are on SIMs accessing the Internet for the first time via that unpaid avenue, and then how many of those SIMs eventually graduate to the wider Internet, on a paid basis, and how quickly? This information is at present difficult to come by from operators – and thus the CAK needs to demand that it is captured and made available to regulator.
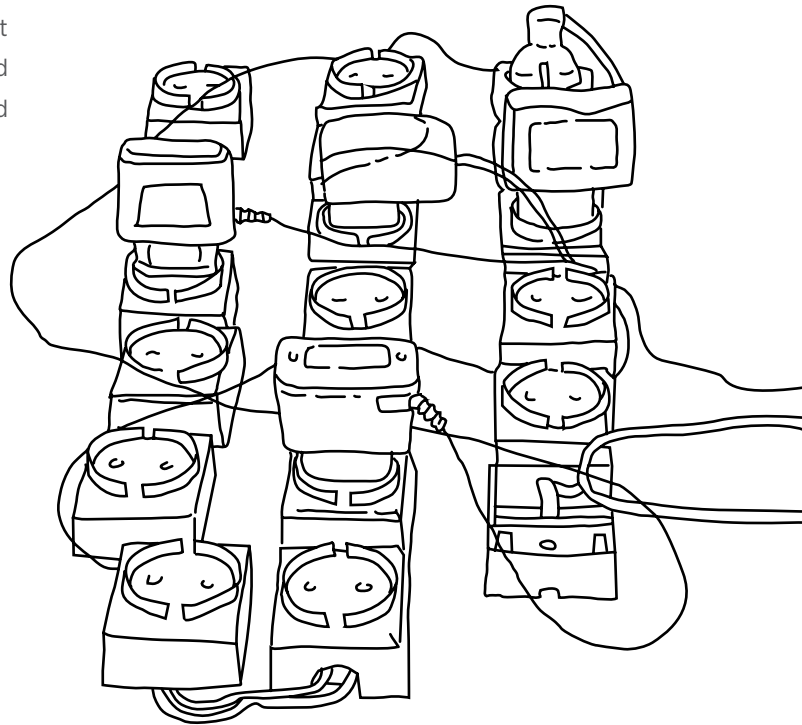
Nigeria

There were no fully-zero-rated MNO products available directly to private consumers in Nigeria at the time of our data collection in late 2015 – despite the fact that there had been many trials and pilots of products and services based on the zero-rating model (A4AI, 2015). (It was only in April 2016, after the completion of the data collection, that a fully-zero-rated offering came onto the market: Airtel's Facebook Free Basics product.)

Nigerian MNO representatives interviewed for this research in January 2016 expressed a general unwillingness to open up their networks to zero-rating. However, they did recognise, and were somewhat nervous about, the fact that the pressure of large global OTT CAPs, who have connected large segments of the global populace to one form of online service or another, would ultimately lead to a revision of existing revenue models. In particular, it was recognised that the dependence on voice revenues would eventually be substituted by dependence on data revenues derived from OTT voice, text and social media apps.

MNOs in Nigeria seemed to be grappling with how to develop a strong business model that could cater to introduction of zero-rated elements in their existing, well-performing mobile data ecosystem of paid data bundles. Our research found 125 data plans on offer, targeted at virtually

the entire spectrum of consumer needs. Yet at the same time, it was reported that 34% of all mobile users were not presently subscribed to a data plan (NCC, n.d. (a)).

The Nigerian telecoms market is evolving along its own particular path. Prices are declining and data services are improving noticeably, yet it would appear that there is need for market intervention by a significant player, or even the regulator, to close the shrinking but still-large gap between those who use their handsets for voice/SMS-only communications and those who use them for both voice/SMS and data. The challenge for any promoter of zero-rating in Nigeria is to convince the MNOs that there will be a significant upside in adoption of new revenue models that accommodate zero-rating.

NIGERIAN ZERO-RATING ENVIRONMENT

Competitive landscape

The global zero-rated-content champions have been in talks for the past several years with Nigerian MNOs, seeking to create partnerships that would allow the CAPs to offer zero-rated products within the country. By the end of 2015, various trials – involving Facebook, Wikipedia, and Opera – had been conducted with operators Airtel, Glo and MTN. But none of these pilots had yet resulted in the launch of a fully-zero-rated product.

Airtel's pilot Wikipedia Zero offering, launched in May 2014, was little-known, hardly promoted, and then discontinued. Another Airtel pilot, which attracted significant publicity, was its Facebook Zero campaign, also launched in May 2014, in partnership with Opera. The project involved the creation of a landing page promoted through SMS and the Internet. Once on this page, mobile users were directed to a link where they would download Opera Mini in order to access Facebook for free. Opera claimed the campaign resulted in an increase of 19.7% in active users of its browser software (Opera, 2014). However, this result apparently did not impress Airtel Nigeria enough for it to continue the service.

As the time of our research, Nigeria's MNOs appeared to be comfortable with their existing methods of attracting and retaining data subscribers. Almost all of the operators were offering "free" data on a rewards basis, linked to customer recharges and other forms of product loyalty. Even the lowest-priced airtime recharges were eligible free data add-ons, thus presumably increasing the attractiveness of data usage for even lower-income mobile subscribers. Table 8 below provides examples of some of the data add-on packages being offered by mobile operators in the country as at the end of 2015, with most add-ons including reward-on-recharge elements.

	Operator			
	Etisalat	**MTN**	**Airtel**	**Glo**
Data add-on packages	EasyStarter: reward of 10MB of data for a minimum weekly recharge of N100 (USD0.50).	SmoothTalk Plus: reward of 10MB of data for a minimum weekly recharge of N100 or more	TalkMore: 100-300% bonus, at time of recharge, for voice calls, SMS and data	BiiGy: bundled packs combining voice, data and SMS as a single plan for a fixed fee of N100 (daily), N300 (weekly) and N500 (monthly)
	EasyCliq: 1MB of free data for N5 (USD0.03) one-day recharge and 15MB weekly data for a minimum recharge of N200 (USD1.01).	SuperSaverPlus: 300% airtime credit value of the bundle and access to WhatsApp	Premier Connect monthly plans: free data bundle of 1GB- 6GB and 50% airtime bonus	Bounce and Generation-G calling plans: free 15MB for every recharge of N200 and above
	Cliqlite: 100% data bonus on any monthly data plan from 200MB to 10GB, and additional 100% data bonus for use of 5 educational sites and 2 social sites		Smart TRYBE: up to 60MB per month free data (i.e., up to 15MB per week via recharge of N200 weekly)	3-in-1 Recharge: free data for every airtime recharge from N100 (22MB of free data) to N5,000 (12GB of free data)

Table 8: Examples of Nigerian MNOs' data add-on offerings

Source: Operator websites

THE "REVERSE-BILLING" MODEL

Nigerian MNOs make substantial use of "reverse-billing" systems. Reverse-billing allows entities to provide zero-rated Internet browsing of their electronic channels, including websites and mobile apps, with the sponsoring entity paying for aggregated data usage by customers who access their online channels, in a bespoke arrangement with the network operator. According to one of the Nigerian interviewees for this research, a number of app developers and media organisations, including Agence France-Presse (AFP) and Deutsche Welle, use this form of billing in Nigeria in order to give online users free, i.e., zero-rated, access to the landing page of a news portal or to the first download of a mobile app. Clients negotiate better data rates for their customers, for either in- or out-of-bundle usage, with invoices settled by the clients post-usage. In-bundle usage is free, and out-of-bundle usage can go as low as N0.01/KB. This compares positively with the default rate of N5.00/KB for pay-as-you-go data usage by private consumers. The networks actively promote this option, as it gives them a single point of guaranteed payment for consumer data usage. (Subscribers who go out of the landing page are charged a pay-as-you-go rate that is taken off each user's airtime. This typically occurs after

the user receives a notification by SMS of a change in the billing method.)

The pricing and conditions of reverse-billing models vary within and among Nigerian MNO networks, with the ability to get favourable reverse-billing rates dependent on the negotiating strength of the corporate customer in question.

IMPLICATIONS OF MODELS FOR FUTURE REVENUES

Voice remains the biggest income earner for MNOs in Nigeria. However, data services are now firmly recognised as the future means of growing operator revenues and profit. According to the regulator, the Nigerian Communications Commission (NCC), active mobile connections in the country as at September 2015 stood at 148.4 million lines, provided by MTN (42%), Glo (21%), Airtel (21%), and Etisalat (16%) (NCC, 2014). The MNOs accounted for 99.7% of all active Internet service subscriptions as at the end of 2014 , with the insignificant balance of 0.3% attributable to fixed wired/wireless providers (NCC , n.d.(a)).

The data package promotion efforts of Nigerian mobile operators had resulted in there being a total of 97 million mobile data customers in September 2015, with a compound annual growth rate (CAGR) of 86.3% in data subscriptions since 2012 (NCC, n.d. (b)) (see Figure 2 below).
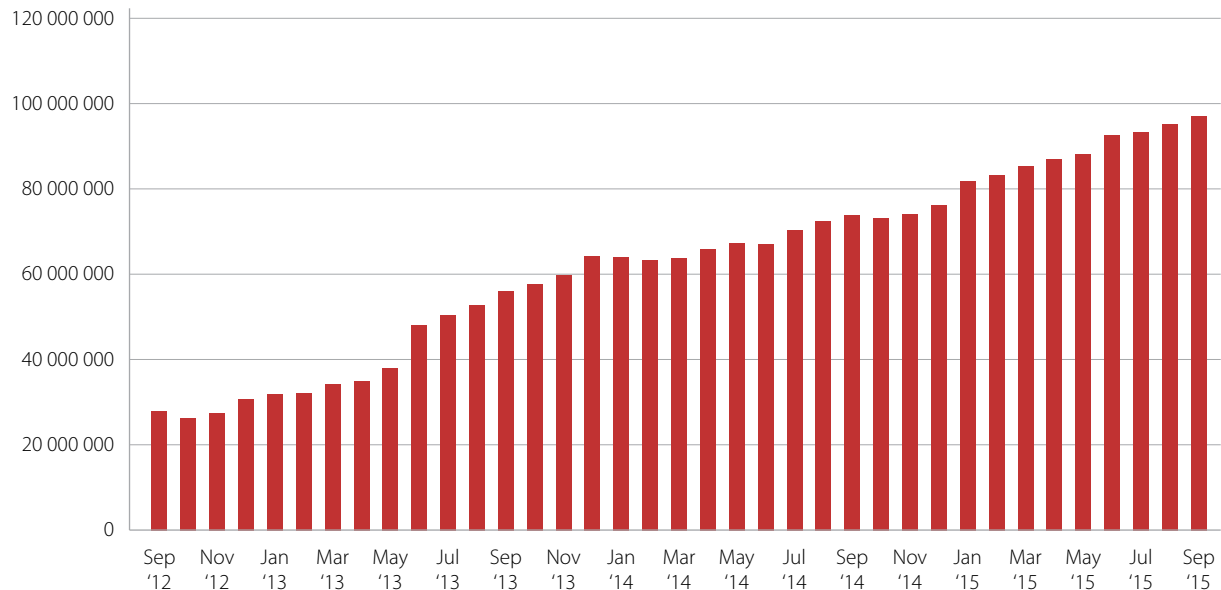

Figure 2: Mobile Internet subscribers in Nigeria, 2012 to 2015

Source: NCC (n.d.(b))

The number of data subscriptions as a percentage of all mobile subscriptions grew dramatically from 28.2% at year-end 2012 to 65.4% (i.e., two-thirds of all mobile subscriptions in the country) in September 2015 (NCC, n.d. (b)). The strong uptake of data subscriptions would appear to back up the operators' contention that their bundles are widely affordable and that their present revenue model is working and does not need to be altered or disrupted. Currently, the contribution of data to overall revenues is about 21% for MTN and 9% for Airtel.[3]

The growth in mobile data use can to a great extent be attributed to the linking of four new private submarine fibre cable links to the country since 2010, namely MainOne (linked in 2010), Glo-1 (linked in 2011), WACS (linked in 2012) and ACE (linked in 2014). Together with the legacy SAT3 link, these fibre links were at the time of the research offering operators a combined capacity of 15TBps, the availability of which has positively impacted network deployments within the country. Operators are now able to deliver faster data products and better services at more affordable prices to consumers.

In light of the positive performance of their commercial data products, the overriding priority for Nigerian MNOs at present is determining how to deliver high-quality voice and data services nationwide at the best cost margins. Senior management of MNOs interviewed for this research said they believed that zero-rating would force a cannibalisation of their data products and disrupt delicately-balanced relationships that they had carefully established with distributors and other network partners. Nigerian MNO representatives did not, at the time of the interviews, appear convinced that there was a clear revenue model that would allow them to deepen their profit levels if they shifted to a zero-rating regime, even if zero-rated packages were to be made available to each user for only a short time period. The MNOs also said they believed that opening up their respective networks to zero-rated services would increase risk of exposure to fraud.

REVIEW OF PREPAID DATA PLANS OF MOBILE NETWORK OPERATORS

All four MNO's in Nigeria were offering various data plans, with distinguishing differences between plans including the pricing offered to consumers, the amount of bandwidth available, the time allowance, and special features. Table 9 highlights which operators were offering what type of data according to the RIA RAMP classification of plans.

Among the 136 data plans that our research found were on offer from the four MNOs in the country, MTN, the dominant Nigerian MNO, was offering the most plans (54), followed by Etisalat (33). Only four plans out of the 136 were designed to work on feature

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[3] Operator financial statements

Type of prepaid data package	Operator			
Operator	Etisalat	MTN	Airtel	Glo
Bundled Data	Yes	Yes	Yes	Yes
Single Service Top up	Yes (Chat paks)	Yes (Social Chats)	Yes (WTF social chats; Whatsapp; and Opera monthly)	No
Combined Service top ups	No	No	No	No
Reward plans (As listed in table 9)	Yes	Yes	Yes	Yes
Fully zero rated offerings	No	No	No	No

Table 9: Prepaid mobile data package types in Nigerian market

Source: Operator websites

phones (i.e., not smartphones). According to the RIA RAMP classification of prepaid data plans:

- 71 of the plans were bundled-data packages;
- 51 of the plans were single-service top-ups, designed to allow consumers to access specific apps or certain content, often priced at a lower rate than bundled-data plans; and
- 14 plans were devoted to rewards, with the user obtaining an equal amount of complimentary data for every MB purchased.

(As stated above, there were no fully-zero-rated data plans on offer as at November 2015, with Airtel's zero-rated Free Basics offering only coming into the market in April 2016.)

All the operators the researcher spoke with were enthusiastic about the demand for, and performance of, their data plans, particularly single-service plans that offered Internet access for use of only low-bandwidth applications (i.e., plans that subscribers could use for online social chat platforms in particular). These social chat plans appeared to be of two variants:

- Universal chat bundles: many chat services in a single plan, e.g., Etisalat's chat pak and Airtel's WTF bundle; and
- Linear chat bundles: a plan specific to a chat service, e.g., MTN's WeChat Weekly and Twitter Monthly bundles.

It was found that some products had reward features that can be seen as forms of partial-zero-rating. Airtel's Unliminet 200, Unliminet 600, Unliminet 3000 and Unliminet 5000 data bundles allowed customers tail-end free access to social chats, with access kicking in after all the purchased data were used up. There were other hybrid features embedded into some of the bundles.

BRIDGING THE DATA ACCESS GAP

Mobile voice/SMS subscribers without data bundles

The biggest challenge facing government and regulatory bodies in Nigeria is how to bridge the mobile data access gap (i.e., the number of mobile voice/SMS subscriptions that do not also include a data plan). Table 10 below shows the reduction in Nigeria's mobile data access gap, from 71.8% to 34.6%, between 2012 and 2015.

the personal hotspot feature of their smartphones or through the all-in-one modem/router combo dongles provided by that MNOs.)

Nevertheless, the number of subscriptions without a data component, 51.3 million as at September 2015 (see Table 9 above) suggests that there is still some way to go to bridging the data access gap. While zero-rating could be helpful in decreasing this gap, it is doubtful that such offerings could alone would convert the entirety of the large number of voice/SMS-only mobile users into data subscribers.

	Dec '12	Dec '13	Dec '14	Sep '15
Active mobile subscriptions (lines)	109,829,223	124,841,315	136,772,475	148,427,043
Active mobile Internet subscriptions	30,939,112	64,229,097	76,324,632	97,060,548
Mobile voice/SMS subscriptions without data plan	78,890,111	60,612,218	60,447,843	51,366,495
Data access gap	**71.8%**	**48.6%**	**44.2%**	**34.6%**

Table 10: Mobile data access gap, 2012 to 2015

Source: NCC (n.d.(b))

However, it cannot be assumed that every mobile subscriber would (or should) want a data access plan. Presently, there is an indeterminate number of mobile users getting Internet access indirectly, via data-sharing and personal hotspots, through friends and family members who have active data connections. (Mobile subscribers can re-transmit signals through

In recent years, there has been a dramatic drop in the prevalence of basic feature phone handsets in Nigeria in favour of more contemporary smart handsets. Nokia's market share (based on its feature phones) declined dramatically from 71% in April 2014 to 22% at the end of October 2015 (Figure 3) (StatCounter, 2015).
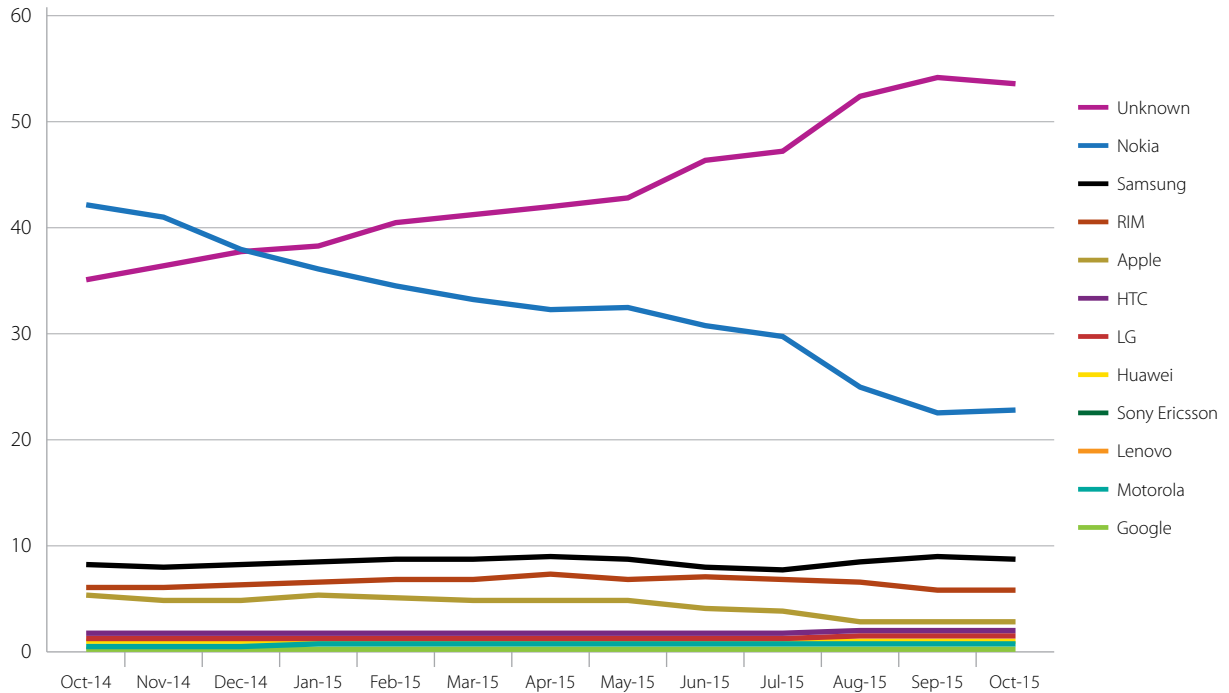
Figure 3: Market share of handset brands in Nigeria (Oct 2014 to Oct 2015, in percentages)

Source: StatCounter (2015)

The purple line represented as "Unknown" in the figure above captures the growth in cheap, low-end smartphone models, typically imported from China. Examples of such Chinese models include relatively well-known brands such as Tecno, but also lesser-known manufacturers and even manufacturers that put no branding on their phones. Save for occasional handset promotions by the mobile operators, new and used phones are usually purchased from third-party retailers or informal channels. The availability of low-cost smart handsets in open markets across the country is helping to promote Internet adoption. Android overtook Series40 as the dominant operating system in Nigeria in October 2014, and by October 2015 accounted for about 55% of mobile and tablet operating systems in the country (StatCounter, 2015) (see Figure 4 below).
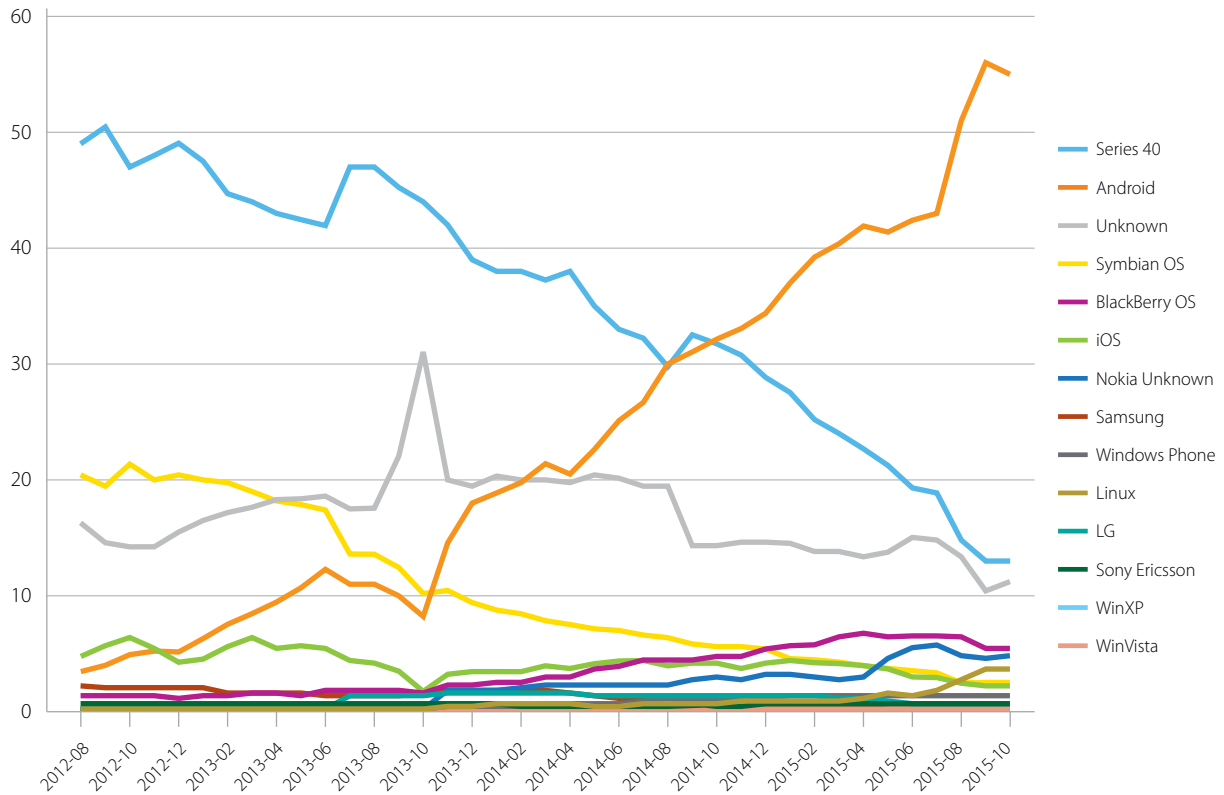
Figure 4: Top mobile operating systems in Nigeria

Source: StatCounter (2015)

MTN said in 2013 that it had experienced a 54% increase in smartphone connections between 2012 and 2013, resulting in there being a total of more than 6 million active smartphones on its network.[4] Smartphone ARPU on the MTN network in 2013 was N922, which was three-and-a-half times greater than MTN's non-smartphone ARPU of N261.[5] The triple effect of the decline in basic legacy feature phones in the country (i.e., decline in use of Nokia phones), the increasing affordability of Chinese-made phones and devices, and the growth in the adoption of Android-based smartphones support the shift towards data usage by large numbers of mobile subscribers.

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[4] MTN Nigeria Analysts' Presentation, May 2013

[5] MTN Nigeria Analysts' Presentation, May 2013

Country	Cheapest 1GB	Cheapest 1GB dominant operator
Ghana	3.86	5.14
Kenya	4.99	4.99
South Africa	5	5
Nigeria	5.08	17.76

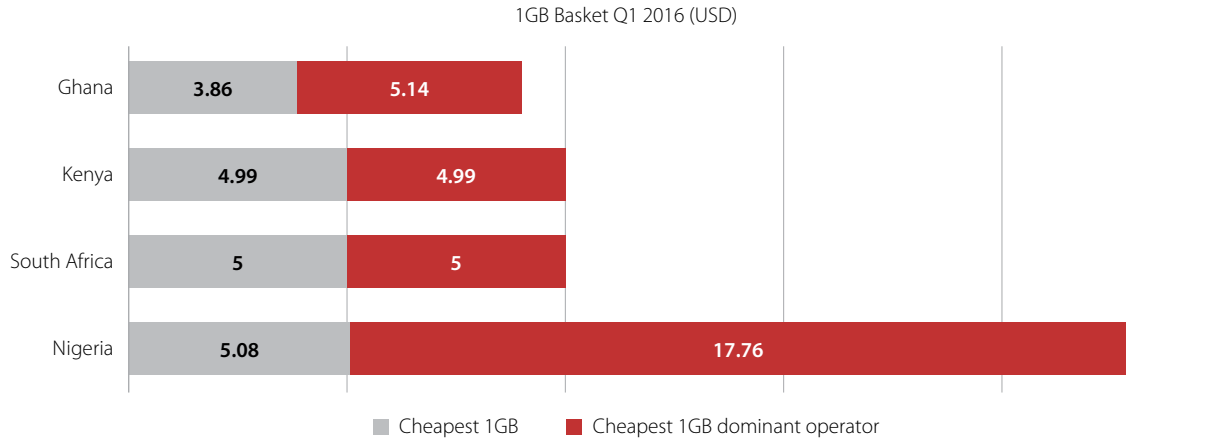■ Cheapest 1GB   ■ Cheapest 1GB dominant operator

Figure 5: RIA RIA African Mobile Pricing (RAMP) portal - 1GB basket price index

Source: RIA African Mobile Pricing (RAMP) portal (RIA, 2015), adapted from OECD usage basket methodology (OECD, n.d.)

Mobile prices have steadily declined over the last five years in Nigeria, and effective mobile data tariffs declined by almost 60% between 2015 and 2016. But still, as shown in Figure 5 above, RIA research found that Nigeria's data tariffs in the first quarter of 2016 were higher, for 1GB of use, than those of the other three countries covered in this paper: Ghana, Kenya and South Africa. Nigeria was found to be the most expensive country of the four for the RIA 1GB data basket. And use of a 1GB data provided by the dominant operator, MTN Nigeria, cost 3.5 times as much as use of a 1GB bundle provided via the cheapest Nigerian offering. (Figure 5 also shows that, by way of contrast, RIA found that in Kenya and South Africa, use of 1GB of data was cheapest via the dominant operators.)

But "social bundles" have very low price points compared to what a customer pays for full Internet access. Presently, the cheapest-priced product in Nigeria is MTN's Quick Facebook Daily bundle, available to subscribers at a cost of N5 (USD0.03). The product gives 24 hours access to Facebook Zero via unstructured supplementary service data (USSD) channels, i.e., Facebook with no video, pictures, or multimedia (so at minimal cost to the operator). The majority of the MTN weekly social chat bundles are priced around N25 (USD0.13) per week, while the monthly variants go for N60 (USD0.310). The operators say the sheer volume of traffic generated by social chat plans more than compensates for the low price entry points.

REGULATIONS AND POLICIES

Because zero-rating could potentially enhance opportunities for price-sensitive and/or first-time users of the Internet, there is a view that regulators should hold off on regulating the practice until it is clear that OTTs are distorting the market or diminishing consumer welfare.

The Nigerian regulator, the NCC, has a strong market liberalisation agenda, and the country has not yet developed any net neutrality frameworks. There are no policies or regulations that would guide evolution of fully-zero-rated or partially-zero-rated MNO provision of access to OTT services. As far as could be determined, there is no regulatory intervention being proposed in Nigeria to either specifically promote or stop the launch of full zero-rating. This may, however, change if and when disruptive moves are made in this regard by any of the mobile operators. (Airtel's launch in April 2016 of Facebook Free Basics represented the first potential disruption of this sort.)

On 13 October 2015, the NCC announced the withdrawal of the floor price on all mobile data products, in order to deepen the growth and development of data services in the country (Vanguard, 2015). (Setting a floor price is a way for a regulator to control the minimum price that can be charged for a product, and is usually imposed in order to curb anti-competitive practices among market players who may offer services at below cost in an effort to push rival operators out of the market.) The effect of the NCC ruling was that from October 2015, Nigeria's MNOs, and indeed ISPs and other players in the data market segment, were free to charge any price for any data offering.

Though it is too early to gauge how the market will ultimately respond to this regulatory move, the initial feedback retrieved during the consultations for this paper was that the MNOs saw this as a positive development that was likely to continue the lowering of data access and usage costs, to the benefit of consumers. The NCC has pledged that if the pricing shifts resulting from removal of the price floor do not benefit consumers and instead result in anti-competitive behaviour, the Commission will restore the floor price (Vanguard, 2015).

CONCLUSION

Full zero-rating has only just arrived in the country (with the April 2016 Airtel launch of Free Basics), and thus it remains to be seen what impact it will have. A key question is whether Airtel's launch of Free Basics will succeed in helping the firm gain market share in mobile data provision and erode MTN's dominance. Another question is whether the other operators will feel compelled to offer competing fully-zero-rated products or whether they will be content to rely on the marketing and sales initiatives, including partial-zero-rating via reverse-billing and other techniques, that have to date proved quite successful in capturing market share in relatively competitive markets.

South Africa[6]

ZERO-RATING AS A LATE-ENTRANT STRATEGY TO GAIN MARKET SHARE

Our data collection in late 2015 found that full-zero-rating was a relatively new tactic for South African MNOs. All three of the country's strongest MNOs – dominant operators Vodacom and MTN, and non-dominant Cell C – were found to be offering partial-zero-rating via combined-service top-ups but only a few fully-zero-rated offers. MTN was the first of the strong players to offer fully-zero-rated services, via a Facebook Zero offering launched in 2010 and a Wikipedia Zero plan offered in 2014. MTN's Facebook Zero, no longer offered, was aimed at the feature phone market, with users enjoying only some of the basic functionality of the Facebook website. Wikipedia Zero is still offered, but must be accessed through the Opera Mini mobile browser.

At the end of August 2015, Cell C became the first and currently the only operator to offer South Africans access to a fully-zero-rated Facebook Free Basics service. Table 11 summarises the current fully-zero-rated and partially-zero-rated products (i.e., requiring payment for service to which a zero-rating component is added/bundled) offered by MNOs in the South African market in early 2016.

Cell C's first deployment of zero-rating began in September 2014, when it launched fully-zero-rated use of WhatsApp text messaging. The popularity

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[6] This South Africa section makes use of content first published in the RIA Policy Paper on zero-rating by Futter and Gillwald (2015).

Operators	Fully-zero-rated products	Partially-zero-rated products (i.e., only available as a component of a paid operator plan/package)	Features
Cell C	Free Basics		Facebook image and messaging functionality (but not videos and calling), plus other selected public interest sites
		WhatsApp	Free WhatsApp in Trace Mobile package
Vodacom	Vodacom e-school		Educational learning app
		Pnet, jobmail and careers24.com job sites	Free to browse career websites if on Vodacom NXT LVL tariff plan
MTN	Twitter		
		Wikipedia Zero	Only when accessed on Opera Mini
	D6 communicator service		A service that allows schools to communicate with parents (100MB data cap)
		MTN Play	Selected download sites for MTN Play subscribers
		MTN Vu	Zero-rated video-streaming for Max Vu subscriptions

Table 11: Fully-zero-rated and partially-zero-rated services in South Africa, first half of 2016

Source: Operator websites

of the promotion was demonstrated in July 2015 when it was found that 1 million Cell C users had utilised the WhatsApp application over a seven-day period between 13 and 19 July 2015 (MyBroadband, 2015). Cell C converted this fully-zero-rated offer to a service-specific-top-up where one pays for unlimited WhatsApp text use monthly (i.e., excluding WhatsApp voice calls).

Vodacom's zero-rating has focused on products that do not compete with its traditional voice and SMS service. It rather zero-rates educational sites and career sites. The career sites zero-rated by Vodacom are only available when one is part of the Vodacom NXT LVL tariff plan targeted at those below 25 years of age.

While MTN, one of South Africa's two dominant market players, was the first to offer zero-rated data via its Facebook Zero offering, more significant has been the deeper engagement with zero-rating by non-dominant third entrant Cell C. Cell C's use of zero-rating needs to be understood in the context of: the entrenched duopoly market (Vodacom and MTN) that it entered as the third entrant; the increasingly

price-competitive market in which the dominant operators are price-setters; and Cell C's position in relation to the fourth mobile market entrant, Telkom 8ta, which has been able to exploit the economies of scale of its fixed-line incumbent owner (Telkom) to consistently offer the lowest prices. The Cell C example shows that zero-rating presents one of the few ways in which smaller market players can increase their market share and competitiveness in the market. In the last quarter of 2015 and based on operator reports, Cell C's estimated mobile subscription market share (for both voice/SMS and data subscribers) was a relatively strong 23% while Vodacom had 37%, MTN SA 35.9% and Telkom 2.6% (BusinessTech, 2015; operator reports).

Cell C's seemingly successful use of zero-rating of OTTs raises serious questions about the effects that regulatory intervention in respect of MNO zero-rating would have in South Africa. While regulation could lower the barriers to entry for local CAP players, it could also undermine the competitive strategy of, in this case, a non-dominant mobile player.

IMPACT ON THE BROADBAND MARKET

When consulted for this research and in their appearances before Parliament at the OTT hearings in February 2016 (PMG, 2016), representatives of dominant operators Vodacom and MTN made statements suggesting that these two main players were less interested than Cell C in adopting zero-rating. Vodacom and MTN were focused more on discounting of on-net voice call tariffs and voice-call tariffs during non-peak calling times. Offering "free" on-net minutes and reduced tariffs at certain times of the day are very persuasive in both growing and retaining market share for incumbents. According to a Cell C representative:

We have seen this first hand in the use of on-net discounting by both MTN and Vodacom, which as you may know, is the subject of a complaint by Cell C to the Competition Commission. We have relied on international literature to support this point. (Cell C representative, personal interview, 2016)

Also according to the Cell C representative:

For smaller operators and/or new entrants, it is clearly an advantage to be able to compete with incumbents using these tactics – but only if incumbents are, at the same time, prevented from introducing or exploiting these pricing strategies, and if smaller operators and new entrants also receive regulatory support at a wholesale level, for example with asymmetric termination rates that are reflective of differences in actual costs plus an uplift that recognises the differences in scale and associated economies for larger operators that are not available to small operators. (Cell C representative, personal interview, 2016)

Otherwise, as Cell C interviewees pointed out, dropping prices or zero-rating services simply reduces margin for smaller operators and their ability to grow market share and revenue share, and to expand and improve on network investment and coverage. The Cell C interviewees indicated that zero-rating certain services has indeed assisted Cell C to gain subscribers, which, the interviewees argued, is why the incumbent former duopoly licensees, MTN and Vodacom, are pushing for regulation of the practices.

IMPACT ON SOUTH AFRICAN CONSUMERS

It is essential that the impact of different forms of zero-rating on consumers is determined prior to any regulatory intervention aimed at limiting the practices. It is a reality that South African consumers are reliant on mobile phones, and that social media are driving uptake of the mobile Internet. We need to understand what makes some zero-rated products successful and others not, and to what degree zero-rating is responding to, or driving, demand. These are issues that can only be answered through a demand-side survey and focus groups, which RIA will be undertaking later in the year, so watch this space.

IMPACT ON SOUTH AFRICAN CONTENT PROVIDERS

Whether broadband providers make use of zero-rating and whether South Africans sign up for zero-rating plans can also impact South African CAPs' ability to compete with more established global providers such as Facebook. A CAP is either a website or application that provides Internet content. Facebook's Free Basics could decrease, rather than bolster, the benefits that broader Internet usage might have for South African economic development. Mitchell Baker, Chair of the Mozilla Foundation, a non-profit organisation dedicated to promoting openness, innovation and opportunity on the Internet, has argued that:

> *Selective zero-rating is arguably bad for the long-term opportunities and inclusion for the people it is designed to serve. It pre-selects what's available, directing people to where others want them to go. It is bad for economic inclusion. It is bad for the ability of new entrepreneurs to grow onto the global scale. It is bad for the long-term health of the Internet. Zero-rating as practiced today is "selective zero-rating" for a few apps and websites; exclusion for the rest of the Internet. (Baker, 2015)*

Baker may be more certain than most about the impact that zero-rating can have. But she does flag one potentially negative outcome of the proliferation of free Facebook offerings. The determination of what is subsidised could potentially stifle competition in local content development. This concern should be particularly relevant in African countries, where the Internet economy is not yet, but has the potential to be, a great source of economic growth.

The Internet Society has found that the Internet economy only contributed 2% to South Africa's gross domestic product (GDP) in 2011, and will only reach 2.5% in 2016 (Mawson, 2015). South Africa lags far behind both developed nations, where the average contribution of the Internet economy was 4.1% in 2010, and developing markets, where the contribution to GDP by the Internet economy was 3.6% in 2011 (Mawson, 2015).

MOVING FORWARD: KEEPING AN EYE ON OPERATORS AND USERS

Via the Cell C Facebook Free Basics offering, both Cell C and Facebook hope to increase Internet uptake, via use of their services, in South Africa. Operators such as Cell C derive much of their revenue from data services, and offering Free Basics is reflective of a strategy that uses zero-rating to capture increased market share. Through its various zero-rated arrangements with both dominant and smaller operators, Facebook is building its new user base outside saturated markets in the North. Research going forward on zero-rating in South Africa needs to focus on the following:

- how ISPs and mobile operators choose to use the tool;
- how users are impacted by the tool; and
- whether local content providers are able to compete with the global CAP players.

South African policymakers and regulators should focus on what types of zero-rated promotions operators present, and how South Africans use them, so as to determine the costs and benefits zero-rating provides to MNOs, users, and CAPs. Ultimately, the greatest challenge may be to decide which benefits and interests of each group must be protected, and which groups' benefits and interests should be curtailed in order to cater to the others.

CONCLUSION

The ICT ecosystem in Africa, as elsewhere around the globe, is characterised by exponential technological development and increasing dependency on connectivity for positive social and economic outcomes. The clash between supply-side infrastructure regulation, which has traditionally characterised telecommunications regulation, and the largely unregulated, complex, adaptive systems of the Internet, which innovate to circumvent traditional infrastructure bottlenecks and barriers to market entry, often through disruptive competition, is evident in the zero-rating debate.

CURRENT STATE OF AFRICAN MNO ZERO-RATING

Zero-rating can induce demand for the Internet by enabling free user access to OTT user-generated content that we know from demand-side surveys undertaken by RIA, and from snippets of big data analytics provided by Facebook, underpins the appeal of social networking platforms. OTTs also serve as substitutes for traditional voice and text services.

Zero-rated products are among dozens (and even hundreds, in some countries) of data products available in African mobile markets. African mobile data users are thus using multiple marketing strategies, of which zero-rating is one. Zero-rating is being adopted by, often late-entrant, MNOs to gain market share in competitive but concentrated markets with usually one or two dominant players.

The African MNOs offering zero-rated use of OTTs clearly see zero-rating as a mechanism to induce data usage by the significant numbers of customers on the networks who have smartphones but are not using, or who are under-utilising, data services – with the idea that users drawn onto zero-rated platforms can eventually be drawn into paid services. Such a strategy is particularly appealing to late-entrant, non-dominant MNOs seeking to boost market share and take market share from dominant operators.

The global OTT platforms and African MNOs have also, to some extent, introduced a social responsibility element into the zero-rating dynamic, via zero-rating of various public service and public interest products and services. For as long as there is not massive use of these products, African MNOs' zero-rating of such content neither particularly positively nor particularly negatively affects their business models.

However, at the same time, it is significant to note that the research data collection for this paper in late 2015 and early 2016 only found fully-zero-rated MNO data offerings in three of the countries (Ghana, Kenya and South Africa), with such offerings

not found to be present in Nigeria. (Nigeria's sole current MNO zero-rated data package, offered by Airtel, only came on the market in April 2016). In Nigeria, and also to a great extent in Ghana, Kenya and South Africa, MNO zero-rated data services were found to be linked in one way or another with paid services, i.e., as part of partially-zero-rated paid offerings.

Regulatory interventions, proposed on net-neutrality grounds, for zero-rated offerings to be non-exclusively offered (i.e., to be offered by all operators) would remove the competitive advantage of the marginal operators adopting this strategy. The example of Wikipedia Zero is instructive. In line with its open policy, the Wikipedia Zero service is offered to all operators on a non-exclusive basis. As a result, the service is widely included in the offerings of both dominant and non-dominant operators across the continent. Wikipedia Zero is regarded as a possible value-add and public service dimension to commercial offerings, but according to the operators interviewed in the four countries studied for this paper, Wikipedia Zero is not seen as a product on which operators are building customer attraction and retention strategies.

WAY FORWARD

When considering whether there should be regulation to ensure positive impacts of zero-rating on markets and on consumer welfare, it is important to shift away from consideration of regulation only in terms of traditional telecommunications sector approaches and competition-oriented approaches – which tend to examine outcomes in terms of somewhat static linear value chains. Instead, consideration needs to be given to finding regulatory approaches that can truly respond to the dynamic efficiencies underlying new market relations, and to the potentially complementary relationship between traditional telecommunications services and newer services such as OTTs from the bigger global CAPs, but also various local or niche OTT apps and services.

There is increasing evidence (Bauer & Bohlin, 2008) of the unintended outcomes that can result from instrumental regulation based on static efficiency and intended to achieve one public policy outcome, such as competition for example, that produces negative dynamics in terms of another policy outcome such as innovation. Understanding the dynamic efficiencies of complementary services is crucial to enjoying the innovation associated with these products and which often enhances consumer welfare.

The elements intrinsic to the success of the zero-rating strategy are the high-demand products, the exclusivity and the subsidy on the data usage for those products. Regulation of any of these aspects would potentially remove the value and purpose of zero-rating for the mobile operator and, in turn, its existence for users.

The dominance of global CAPs, and the inability of local African developers of content and apps to compete with the global players, do present serious challenges, but these challenges exist regardless of whether global CAP services are zero-rated or not. Demand for Facebook, WhatsApp, Twitter and Instagram is what is driving Internet take-up in Africa, in both its zero-rated and non-zero-rated manifestations. In all four African countries studied for this paper, it was found that local producers were not the ones developing the content or apps driving take-up. That there is a need for the development of relevant content in local languages to meet the diverse needs of users is undisputed. That policies and strategies in support of local digital enterprises are required is also clear. But it is contestable whether mobile operators' offering of limited amounts of free (or discounted) access to globally-dominant CAP platforms is preventing local companies from entering the market or one day becoming global platforms. Insufficiencies in access to finance, technology, and management expertise are arguably more likely to be barriers to market entry in markets starved for local content and applications.

Our research for this paper found that zero-rating is one of many supply-side strategies being used to stimulate data demand in resource-constrained African environments. It must be remembered that the four countries examined for this study represent the more developed markets in sub-Saharan Africa.

Caution should be exercised in contemplating policy-regulatory measures that could inhibit the innovation of African MNO operators and users, with both these groups harnessing and adjusting complex, adaptive global systems to suit the particular conditions that exist in developing countries. These systems are able to find ways around bottlenecks in old infrastructures and institutions. They overcome the lack of coordination between the private sector and the state in terms of investment in infrastructure, demand stimulation, and supply of services.

The problem of lack of public-private coordination is not unique to sub-Saharan Africa: next-generation network deployment in EU countries is lagging other OECD countries, and improved cross-sector coordination is seen as one of the potential solutions. What is different in sub-Saharan Africa, compared to the EU, is that the national environments are ones of relative scarcity of resources. Consumers cannot drive network deployment to rural areas, because population density and/or incomes are typically too low. Resources and capacity are scarce, so effective coordination between players – with and between the state sector and private sector – is crucial.

However, while coordination is important, it is competition that remains the primary driver of access and affordability. And as stated above, the new complex adaptive systems are not amenable to being regulated instrumentally in terms of assessments of static efficiency. Instead, regulation needs to be in terms

of the dynamic efficiency characteristics of the new, complex, adaptive systems that predominate on the Internet. Relationships that in a traditional competition assessment may appear to be vertically integrated or anti-competitive may in fact be complementary and, in being so, enable innovations around products, costs, or quality that would otherwise be inhibited or prevented through instrumental competition regulation or sectoral regulation. In such dynamic markets, creating enabling environments for network and service extension, while at the same time creating incentives for innovation, is particularly challenging at the institutional level. It will require the same adaptiveness as the new complex systems being regulated.

Within this context, we offer four broad categories of policy and regulatory recommendation:

- with the dearth of public resources (financial, human, institutional) at the policy level, there is a need to create an enabling environment for the leveraging of private-sector investments for the delivery of public services that can create the conditions for competition and innovation;

- regulation must ensure a level playing field for competition (which can in turn drive demand through pricing and product innovation that is responsive to the local needs);

- competition regulation needs to be done in a non-instrumental way that looks at markets in terms of dynamic efficiency rather than static efficiency, which may require regulatory forbearance in order to determine the nature of commercial relationships and their complementary or competitive nature; and

- there is a need to develop coordinated demand-stimulation strategies (including ensuring affordable public and private access, reduced input cost for business, e-literacy extension, development of specialist tertiary level skills, and incentives for local content and app development), which will grow the local industry and markets so that they can not only contribute to national economic growth, development and job creation, but also make countries more globally competitive, both as investment destinations and as producers of products and solutions for global markets.

FURTHER RESEARCH

Far more needs to be understood about the use of zero-rated services, so as to determine more clearly the degree to which there are positive consumer welfare outcomes. Although some indicators and initial publicly-available data suggest zero-rated social networking draws new users onto the Internet, this assertion needs to be tested more thoroughly. Whether zero-rated products, such as Free Basics for example, provide a gateway to the Internet can only be determined through proper, nationally-representative, demand-side surveys in national prepaid mobile environments.

Many Africans use multiple SIM cards and switch between operators to optimise access to promotions and products. As a result, many of the "new users" Facebook claims are joining mobile data networks at faster rates may have been existing users of mobile Internet. Facebook can move this argument forward by making its underlying data publicly available – as part of its open data commitment – and allowing researchers to verify its claims about the benefits of zero-rating. But in a multiple-SIM environment, even big data analysis of SIM card and data activity from the time of first purchase and use (i.e., the kind of data Facebook has) is not sufficient for identification of, and in turn understanding the behaviour of, a first-time user.

But emphasis on Facebook data implies that the subsidy for zero-rated mobile data in African contexts is coming from CAPs, and that the subsidy is somehow philanthropic. In reality, in Africa's mobile broadband environments, it is the MNOs who are driving the strategy. And though they may put a public interest spin on it, the operators' incentives are ultimately profit-driven.

There is also the question of whether we are witnessing development of a new "digital divide" between those who have unlimited access to Internet content and those who have limited access to zero-rated content. Some will argue that some Internet access is better than none at all. Moreover, Facebook data suggest that new Internet users are not trapped within a new digital divide and can graduate from zero-rated limited Internet access to paid-for access to the full Internet. But with zero-rated social networking services often being offered by non-dominant players in African national mobile prepaid markets, we can assume that it is not the majority of citizens who are utilising the services. And it must also be acknowledged that greater affordability of bandwidth, though it undoubtedly stimulates demand, still does not resolve the digital divide between those with the ability to harness the benefits of the Internet and those who may not have the skills to go online, or not have sufficient skills to go beyond basic functions. For instance, the RIA 2011-12 South Africa Household and Individual ICT Access and Use Survey found that low-income South Africans going online may

end up spending money on mobile data that would have been better spent on essentials such as food and education (Gillwald *et al.*, 2012).

The core question is whether zero-rated applications can help attract new Internet users without harming those users' overall well-being. If zero-rated applications can deliver benefit rather than harm, then in countries where there is a competitive mobile sector, a movement to ban zero-rating could paradoxically prevent the very thing that competition is meant to achieve: choice.
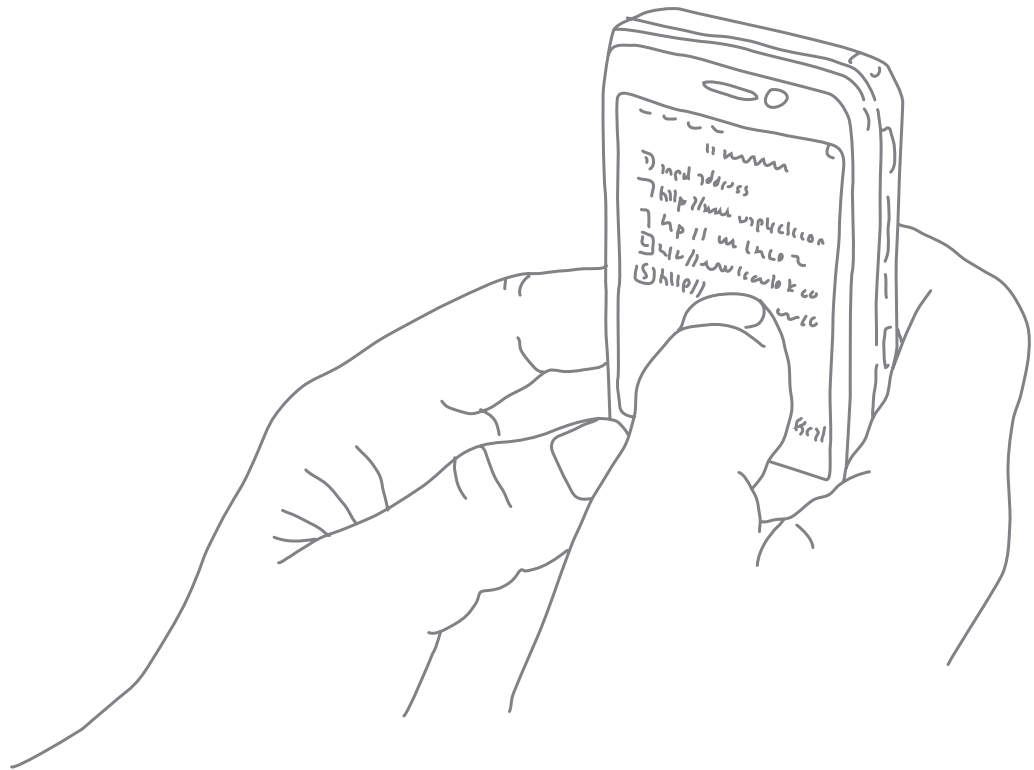
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INTERVIEW LIST

Ghana

Ghana Investment Fund of Electronic Communication (GIFEC) official, interviewed September 2015

Ghana Telecommunications Chamber (GTC) representative, interviewed August 2015

Eyome Ackah, Chief Technology Officer, TXT Ghana, interviewed August 2015

Eric Nsarkoh, Executive Director, Sales and Distribution, MTN Ghana, interviewed August 2015

Sampson Ammamoo, Partner Accounts Manager, MTN Ghana, interviewed August 2015

Lionel George, Head of ICT, Regional Maritime University, interviewed August 2015

Emmanuel Owusu-Oware, IT Consultant and Managing Partner, A&E Options Ltd, interviewed August 2015

Micheal Nii Boye Adjei, Commercial Director, Vodafone Ghana, interviewed August 2015

Nana Dufie Badu, Director, Consumer and Corporate Affairs, National Communications Authority (NCA), interviewed August 2015

Dr. Godfred Frempong, Principal Research Scientist, Science and Technology Policy Research Institute (STEPRI), Center for Scientific and Industrial Research, interviewed August 2015

Prof. Richard Boateng, Head of Department, Management Information Systems (MIS), University of Ghana Business School, interviewed August 2015

Kenya

Steve Chege, Director, Corporate Affairs, Safaricom, interviewed January 2016

Marilene M Gaya, Value-Added Service Manager, Telkom Kenya-Orange, interviewed January 2016

Chris Kemei, Director of Licensing, Compliance and Standards, Communications Authority of Kenya (CAK), interviewed January 2016

Levi Nyakundi, Director, Marketing, Airtel Kenya, interviewed February 2016

Nigeria

Etisalat representative, interviewed January 2016

MTN representative, interviewed January 2016

Airtel representative, interviewed January 2016

Glo representative, interviewed January 2016

Head of Value Added Services (VAS), Starfish Mobile, interviewed January 2016

Head of Digital Applications, Nokia, interviewed January 2016

South Africa

Kerron Edmunson, Regulatory Consultant, Cell C, interviewed 15 June 2016.

Graham Mackinnon, Chief legal officer, Cell C, interviewed 15 June 2016.

Herman Pretorius, Strategy Executive Cell C, interviewed 15 June 2016.

Meeting of the Telecommunications and Postal Services Committee, Parliament of South Africa, on Committee on Over-the-top (OTT) Policy and Regulatory Options, 26 January 2016: Submissions and engagements by:

- Cell C
- MTN
- Vodacom
- Facebook
- Google
- Microsoft