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Net neutrality and market power: the case of South Africa

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Net neutrality and market power: the case of South Africa

Genna Robb¹ and Ryan Hawthorne²

1. Introduction

Net neutrality rules have been implemented in many developed countries, often in response to concerns over ISP market power and potential blocking or throttling of content (Greenstein et al, 2016 and Easley et al, 2018). However, developing countries have significantly lower levels of internet penetration and usage, and ISPs charging content providers in violation of net neutrality may result in lower prices to consumers and greater adoption of internet services (Kramer et al, 2013 and Easley et al, 2018). Furthermore, the case for *ex-ante* net neutrality regulation in markets with competition among ISPs is not clear (Crocioni, 2011 and Kramer et al, 2013). Market power in respect of internet access looks quite different in developing countries, given that mobile is the predominant means of connection and there are often three or more mobile operators. In certain developing countries, including South Africa and Kenya, fibre to the premises is being rolled out, in some cases on an ‘open-access’ basis. A further consideration in developing countries like South Africa and many other African countries is that there is a quasi-monopoly in the paid broadcasting market which is not vertically integrated into internet services (the same satellite TV provider, Multichoice, broadcasts across much of the African continent). Competition from mobile operators in offering their own content and that of third parties (such as Netflix) at lower data prices may help to bring about more competition in markets for paid TV. This means that developing countries may have quite different policy objectives where net neutrality is concerned, depending on market circumstances.

First, we describe the market structure and dynamics in ISP and content provider markets in South Africa. Next, we investigate the theories of harm in more detail. In terms of the ISP market we investigate whether conduct in violation of net neutrality such as throttling and blocking has been taking place and whether it is likely to in future. We explore data on the number of announced prefixes and peers and IP addresses originated in order to get a sense of the size and market power of ISPs and the relationships between them. We then assess competition at the content provision level including websites, social media over-the-top services, video on demand and broadcasting. We consider examples of bundling and zero-rating conduct by ISPs which appear to be the result of vibrant competition and beneficial for consumers. We provide conclusions in a final section.

2. Industry background

Internet and TV access in South Africa

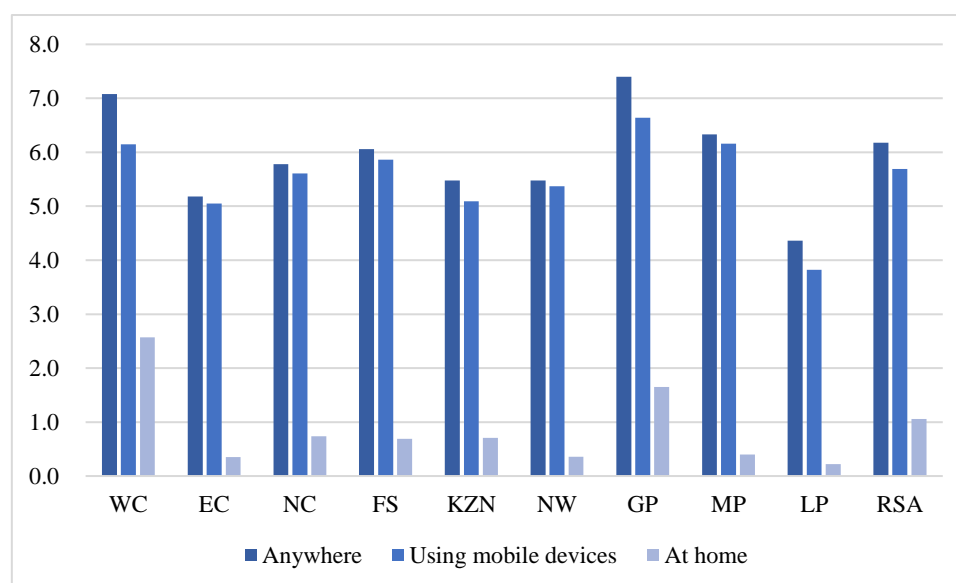
The bulk of internet access in South Africa is via mobile devices (see Figure 1 below). Approximately 62% of households have at least one household member able to access the internet somewhere (at home, at work, via mobile), and 57% of households have at least one household member able to access the internet via mobile. Only 10.6% of households have access to the internet at home, and this varies significantly by province: in the largely rural province of Limpopo, for example, only 2% of households have access to the internet at home. Thus, internet access in South Africa is mainly via mobile devices.

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A substantially greater proportion of households (82%) have a television set.³ By far the main method by which television content is accessed is via ‘regular TV on a TV set’ (see Table 1 below). Thus, most content consumed in South Africa is via linear, broadcast television using traditional TV sets.

Figure 1: Internet access in South Africa (2017)



Source: Statistics South Africa, 2018, General Household Survey, available [here](#).

Table 1: Comparison of the methods and devices used for accessing “television content”, 2018

	% of internet users
Regular TV on a TV set	91%
Recorded content on a TV set	18%
Catch-up/on-demand on TV set	14%
Online content streamed on another device	8%
Online content streamed on TV set	6%

Source: We are Social Annual Digital survey 2018, available [here](#)

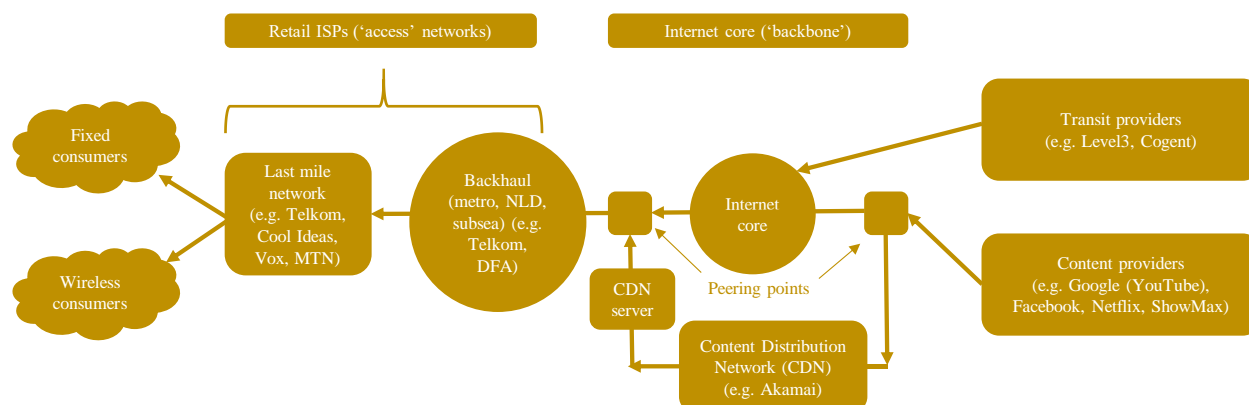
ISPs

Before discussing ISPs and content providers in more detail, it is helpful to briefly discuss the structure of the internet and, in particular, the vertical chain of service providers which are involved in bringing content to end users in South Africa (see Figure 2). At a very basic level, the internet exists to allow end users or consumers to access various types of content. At one end of the value chain therefore are content providers such as Google (including YouTube), Facebook/Whatsapp, Netflix, and ShowMax. How they get this content to consumers via the internet is central to the net neutrality debate. They may do so passively via their web hosts or actively through peering and /or content distribution networks (CDNs).

³ Source: Statistics South Africa, 2018, General Household Survey, available [here](#).

Peering involves the exchange of traffic between networks and can occur on a bilateral basis or publicly at an internet exchange point (IXP). Content providers may host their content with a large backbone provider or at an IXP, with which internet access providers (ISPs) must then peer in order to get access to the content. Alternatively, content providers may make use of CDNs which use a network of servers to store information and content closer to consumers. Generally speaking, the closer to the consumer the content is stored, the higher the quality of user experience. This is particularly important for streaming applications. Content providers may set up their own CDNs or make use of third party CDNs such as Akamai. In addition to these approaches, content providers may use transit providers such as Level3 and Cogent or host content directly with certain ISPs which have a large volume of traffic.

Figure 2: The structure of the internet



Source: Adapted from Crocioni (2011)

In South Africa, the fixed and mobile markets are still concentrated at the infrastructure level, with partially state-owned incumbent Telkom dominating the fixed market and a duopoly (Vodacom and MTN) accounting for a large proportion of infrastructure in the mobile market. However, at the services or ISP level, markets have become more competitive, particularly on the fixed side.

Telkom has developed a wholesale business, OpenServe, in response to pressure from the competition authorities. Telkom offers access to its network on a wholesale basis, though its wholesale prices are unregulated, unlike in other mainly developed countries where the fixed line operator is functionally separated between wholesale and retail activities. A wide range of ISPs are now able to access consumers through Telkom's ADSL lines which has generated competition at the access level, although customers still have to pay Telkom for line rental. A number of fibre networks are also being rolled out targeting small businesses and upper income suburbs.

Challenger fixed line networks including Neotel, Dark Fibre Africa and FibreCo and smaller new entrants such as Vumatel and Cybersmart also provide wholesale access to their fixed line networks, albeit at different levels. Dark Fibre Africa and FibreCo offer dark fibre (layer 1) access, while Neotel, Vumatel and other smaller networks typically do not offer 'layer 0' (such as ducts and poles underlying the physical bearer) or layer 1 access. Vumatel and similar fibre networks do not offer retail internet access services to consumers but rather provide wholesale access to a large number of internet service providers (ISPs) who do so. The Seacom subsea cable is also provided on an 'open-access' basis to a range of licensees in South Africa, and other subsea cables including WACS and Eassy though run by consortia of operators, provide wholesale services to a range of licensees.

Mobile networks operated by MTN, Vodacom, Cell C and Telkom Mobile are also offered on a wholesale basis to a certain extent. MTN and Vodacom offer national roaming services to Telkom Mobile and Cell C respectively. Nonetheless, the arrangements are not regulated by the Independent

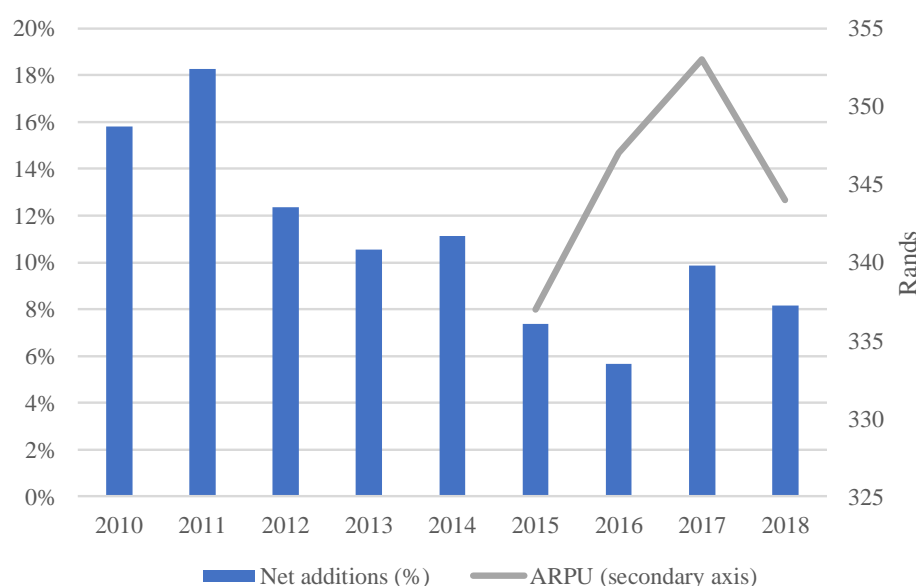
Communications Regulator of South Africa (ICASA) and are not offered in terms of reference roaming offers, and at least Cell C has complained about quality of service (including problems with seamless handover and data roaming), access to sites and pricing. Cell C offers a mobile virtual network operator (MVNO) platform to Virgin Mobile, FNB Connect and others. MTN and Vodacom also have various resale and wholesale data arrangements via Access Point Names (APNs) with Internet Service Providers (ISPs), including MTN offering wholesale services via Afrihost and Axxess, and Crystal Web offering Vodacom services. Again, these MVNO, APN and similar arrangements are not regulated, and so questions again arise as to the quality of service and wholesale prices. Recently, a new entrant at the wholesale level, Rain, has started to roll out an LTE network and offers wholesale services to ISPs as well as roaming services to Vodacom. A large number of wireless ISPs (WISPs) also exist across the country.

It is important to distinguish between ‘access network’ ISPs and ‘backbone’ ISPs. ‘Access network’ ISPs connect end-customers, while ‘backbone’ ISPs connect other ISPs to the internet. Both of these levels are separated from infrastructure providers, although there are some ISPs which are also infrastructure providers such as Telkom, MTN and Vodacom. Access providers without their own backbone network purchase services from backbone providers, which in turn purchase access to infrastructure at international, national, metro and “last mile” levels as required, as well as data centre services. Some access providers, such as Cool Ideas, self-provide backbone services to some extent through, for example, peering at international exchange points and purchasing capacity on undersea cables. However, they do not sell backbone services to other access ISPs.

Broadcasting

Television, and subscription broadcasting has long been a concentrated market in South Africa, with pay television dominated by a single firm, Multichoice. Despite new entry, Multichoice remains by far the largest player in the sector. Multichoice reported 6.9 million video entertainment subscribers in 2018. Its subscriber growth in South Africa remains strong, increasing by over 8% in FY 2018. However, the growth has been declining (Figure 3) and Multichoice notes that this is particularly true of the premium segment (Naspers, 2018). This likely explains why its average revenue per user (ARPU) dropped in 2018. As will be discussed in more detail below, the premium segment is likely where Multichoice faces the strongest competition from online streaming platforms such as Netflix.

Figure 3: Multichoice net additional subscribers and ARPU, South Africa 2010 - 2018



Source: NASPERS Analyst Books and results presentations

Despite increasing competition from online streaming services, Multichoice still holds the rights to most premium sports content in South Africa, including local football, rugby and cricket leagues as well as major international football content (Champions League, Europa League, English Premier League and Spanish La Liga), giving it a strong market position. Concerns have arisen over the lack of competition in the subscription broadcasting market with ICASA launching an inquiry in 2016 in part due to concerns over the lack of launch and sustainability challenges faced by new entrants (ICASA, 2017). Pay-TV competitors StarSat and OpenView have failed to make substantial inroads into Multichoice's market share and subscription television is still a highly concentrated market with Multichoice enjoying a market share of 98% (ICASA, 2017).

Content providers

In most developed countries, web browsing made up the majority of traffic from the mid to late 1990s but by the mid-2000s, this had changed to peer-to-peer traffic. Today, streaming traffic for video applications makes up just under two thirds of traffic (Greenstein et al, 2016). We do not have similar traffic figures for South Africa, but video streaming has grown substantially in South Africa as well.

In terms of unique South African browsers, Effective Measure reports that South Africa's most popular websites are mainly news websites such as News24, Times Live, the Independent Online and Eyewitness News (Table 2). The majority of page views are from mobile devices.

Table 2: Top 10 websites in South Africa in March 2018, by unique SA browsers

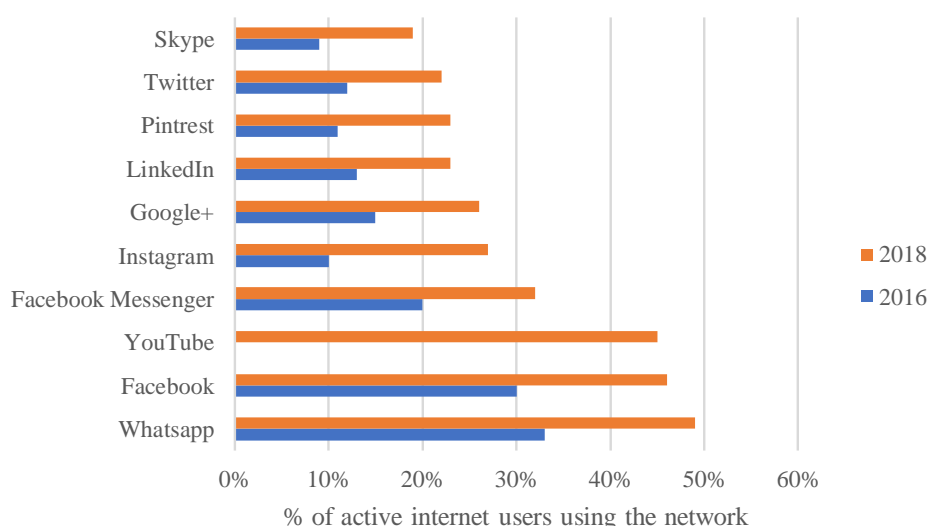
Name	Type	Unique SA Browsers	Page Views	Proportion of PVs on a mobile device
news24.com	News	6,166,741	62,858,399	60%
gumtree.co.za	Classified adverts	5,593,687	143,527,776	59%
timeslive.co.za	News	3,935,629	20,484,862	76%
iol.co.za	News	3,739,980	19,365,476	61%
ewn.co.za	News	3,526,706	24,879,098	84%
msn.com	News and entertainment	2,952,792	42,448,027	7%

Name	Type	Unique SA Browsers	Page Views	Proportion of PVs on a mobile device
Vodacom Vlive	Games, music, videos (for Vodacom subscribers only)	2,562,928	16,598,663	99%
enca.com	News	2,351,286	9,369,314	78%
sport24.co.za	Sports news	2,208,889	18,626,586	69%
Mybroadband.co.za	Tech news	2,112,026	7,932,118	62%

Source: Effective Measure “South Africa Online: March 2018”. Available: [here](#).

In terms of social media, the largest number of South Africans use Whatsapp, Facebook and YouTube with between 45% and 49% of internet users in South Africa reporting that they use the three applications in January 2018 (Figure 4). Also popular with between 20% and 40% of internet users actively using them are Facebook Messenger, Instagram, Google+, LinkedIn and Twitter. There are a number of cross-ownerships among the major social media applications globally with Facebook owning Instagram and Whatsapp, Google owning YouTube and Microsoft owning Skype and LinkedIn. Therefore, out of the top ten social media applications in South Africa, there are only five independent groups. Usage of all of the top ten social platforms in South Africa increased substantially between 2016 and 2018.

Figure 4: Top active social platforms in South Africa in January 2016 and 2018 according to users



Source: Results of We are Social Annual Digital survey 2016, available: [here](#); 2018, available [here](#).

Over-the-top services

Increasingly so-called “over-the-top” (OTT) services like Facebook, WhatsApp and Skype are replacing SMS and voice communication and driving consumers to demand less of these services and more data. In response to this, mobile operators internationally and in South Africa have called for OTT players to be regulated more closely and, in some instances, have suggested that OTT players should compensate operators for their costs of network deployment. In 2016, a parliamentary portfolio committee hearing on the regulation of over-the-top services sparked a debate on this issue in South Africa.

Similarly with regard to over the top (OTT) streaming internet video services, the incumbent pay TV provider, Multichoice, recently called for Netflix to be regulated. Netflix entered the South African

market in January 2016 and, according to estimates by Multichoice, may have as many as 300,000 to 400,000 subscribers. Multichoice also has a streaming service, Showmax, which enjoys premium content such as movies and series as well as local content. Google Play and Amazon Prime also entered the South African market in 2016. Vodacom's service VodaPlay offers premium movies and series to Vodacom subscribers on their smartphones. A survey conducted by MyBroadband in 2018 found that 65% of advanced internet users surveyed (9,857 MyBroadband readers and contributors) reported having a Netflix subscription, compared to just 39% with a Showmax subscription and 13% with an Amazon Prime subscription. Dstv subscribers were more likely to be subscribed to Showmax (45%) and less likely to be subscribed to Netflix (52%) than the overall survey respondents.⁴ More recently the market has seen further new entry from Kwese Play, owned by large African telecommunications firm Econet, and Black by South African MNO, Cell C. DStv has also announced plans to open up its streaming service DStv Now to non-subscribers from 2019. As Multichoice has licenses for most premium sports content currently, this may make DStv Now a very attractive offering.

Table 3: Streaming services in South Africa, July 2018

Streaming provider	Launched	Premium movies and series	Premium sports	Local content	Subscribers	% of advanced internet users subscribed in 2018
Showmax (Multichoice)	August 2015	Yes	No	Yes		38%
VodaPlay (Vodacom)	August 2015	Yes	No	No		
Netflix	January 2016	Yes	No	No	300,000 to 400,000	65%
Google Play	February 2016	Yes	No	No		
Amazon Prime	December 2016	Yes	No	No		12%
Digital Entertainment On Demand (DEOD)	May 2017	Yes	No	No		
Kwese Play	September 2017	Yes (Netflix is one channel)	No	Yes		
Black (Cell C)	November 2017	Yes	Limited	Yes		3%
DStv Now (Multichoice)	2017 for DStv subscribers, 2019 as standalone	Yes	Yes	Yes		

Source: company websites; Multichoice submission to ICASA inquiry into competition in subscription broadcasting, available [here](#); ICASA discussion document on competition in subscription broadcasting, available [here](#); MyBroadband survey, available [here](#).

While content has often been a stumbling block to entry in the South African pay-TV market, Netflix owns a range of content and Showmax, a subsidiary of Multichoice, allows consumers to access Multichoice shows as well as a wide range of local content.

3. Assessing the theories of harm

In this section we assess the theories of harm related to net neutrality in the South African context. As noted above, so-called “triple play” bundles of internet, landline and broadcasting services are not common in South Africa, but some degree of ISP market power and vertical integration between content

⁴ MyBroadband, 4 June 2018. ‘The most popular Netflix package in South Africa’. Available [here](#).

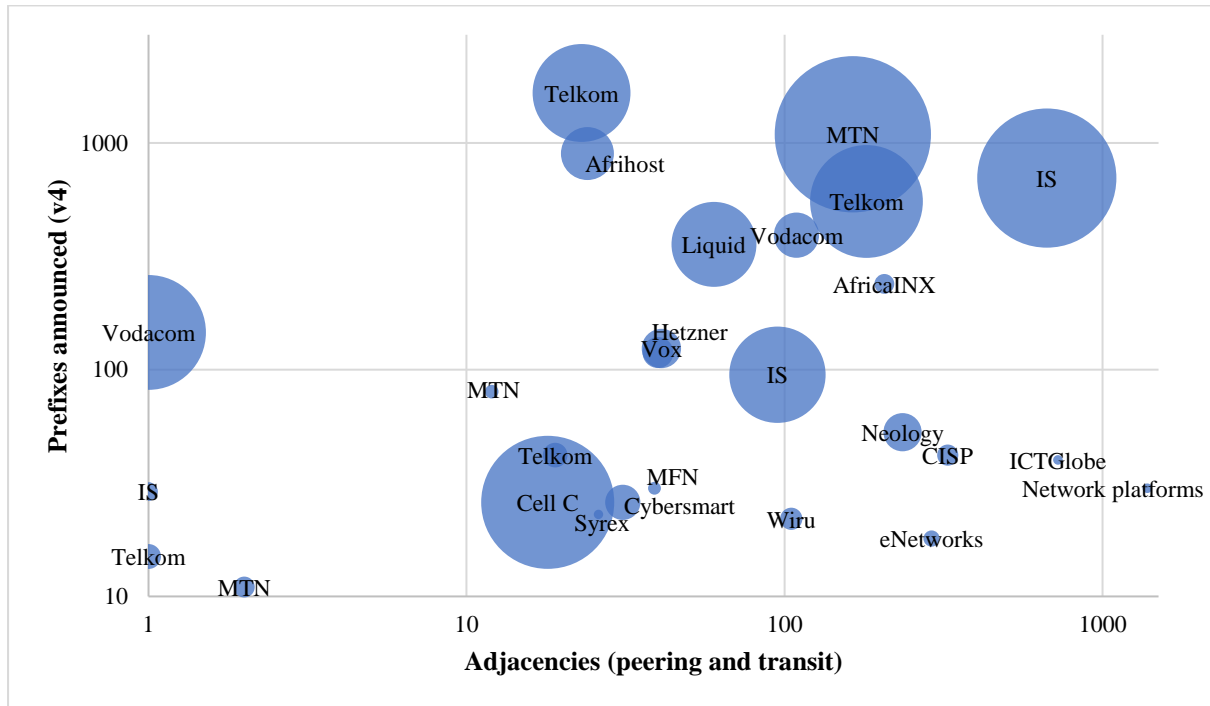
providers and ISPs do exist. We begin by assessing the market power of South Africa's ISPs in greater detail, in order to understand their ability and incentive to throttle or block unfavoured content.

Measuring market power among internet service providers is difficult to do, because of the complex and private nature of peering agreements between operators. Two means of measuring the 'backbone' dimension are measuring the number of prefixes announced and the number of adjacencies (see Figure 5). The number of adjacencies includes peering (free) and transit (paid for) arrangements. There are a number of such backbone providers in South Africa, including Telkom (the fixed-line incumbent but also a small mobile operator), Internet Solutions ("IS", a large wholesale and business ISP), MTN and Vodacom (also incumbent mobile operators) and Liquid Telecom (also a large wholesale and business ISP). Adjacencies are the parties with which ASes (networks) exchange traffic directly. Note that the various backbone providers have a number of ASes in Figure 5. A prefix is a group of one or more networks typically assigned to only one AS. A large number of prefixes announced by an AS means that that AS, typically referred to as an 'upstream' AS, offers access to a large number of networks, some of which may be 'downstream' ISP networks. The fewer the prefixes announced by an AS, the fewer the 'networks' that can be accessed via that AS's network. ISPs with fewer announced prefixes and fewer peers are more likely to be 'downstream' ISPs that make use of 'upstream' backbone ISPs.

The number of peers and the number of prefixes announced are relatively crude (though widely used) measures of backbone network relative size. This is because neither of these measures actual traffic flows between networks, which is the real measure of an upstream provider's size. Information on traffic flows between networks is not disclosed to the public. In addition, some operators with large numbers of adjacencies may only announce a small number of prefixes, such as Network Platforms. We understand that Network Platforms has opted for a 'wholesale model' where they have a large number of peers through public peering at IXPs in various countries but may exchange relatively little traffic over those peering links.

One measure of 'downstream' size is the number of IP addresses originated on the network. In Figure 5, the bubble size reflects the number of IP v4 addresses originated on an AS. This is a relatively crude measure of downstream market size, since we understand that at least the mobile network operators may have large numbers of end users behind individual IP addresses.

Figure 5: ISPs number of prefixes announced, adjacencies and IP addresses originated (bubble size)



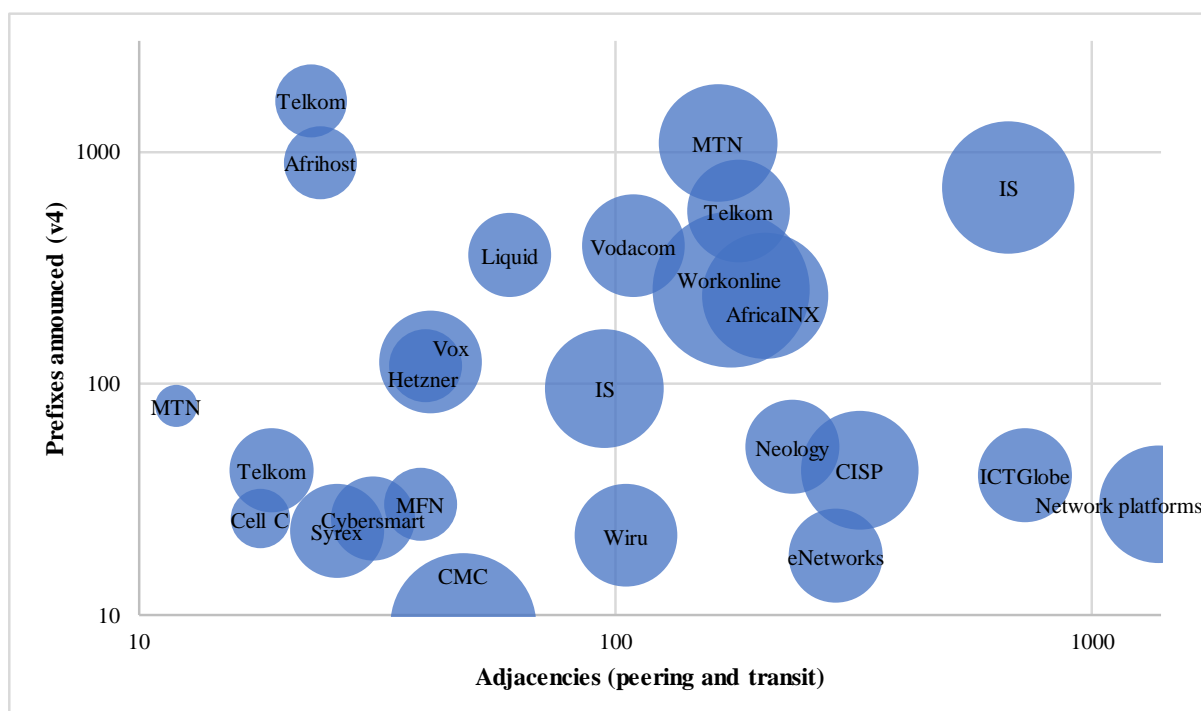
Source: Authors' analysis of data available at: <https://bgp.he.net/country/ZA>

South Africa therefore has a number of large 'backbone network' providers that also have large 'access network' customer bases (at least Telkom, MTN, Vodacom, Cell C, Internet Solutions, Liquid Telecom and Vox Telecom fall into this category⁵) as well as a number of small ISPs that have few end users but nonetheless have extensive peering arrangements and therefore substantial backbone networks (including Neology, CISP, Network Platforms, Wiru and eNetworks). We note that while Telkom and Liquid Telecom (formerly Neotel) historically did not peer with smaller ISPs, they changed this policy in the last few years in that Telkom now 'announces' its retail ADSL customer base to peers. Liquid Telecom's policy has recently changed due to Liquid Telecom's acquisition of Neotel.

These open peering policies mean that the large access network and backbone network providers all peer extensively in South Africa (bubble size in Figure 6 is now number of peering points, and not number of IP addresses as in Figure 5). The effect of all of this peering is that NAP Africa, the main peering provider in South Africa, has seen an enormous increase in traffic across its peering points in Johannesburg, Cape Town and Durban. In Johannesburg, for example, over the past 15 months, NAPAfrica's peak traffic has increased three-fold from 144Gbps to 440Gbps (see Figures 7 and 8 below).

⁵ Note that TENET is the university network in South Africa, and is not considered a commercial ISP in South Africa and is thus excluded from Figure 3. Note further that the scale of the figure is logarithmic, and that ISPs originating fewer than 10,000 IP addresses were excluded in order to make the figure more clear.

Figure 6: ISPs number of prefixes announced, adjacencies and internet exchange points (bubble size)



Source: Authors' analysis of data available at: <https://bgp.he.net/country/ZA>

Figure 7: Inbound traffic, NAPAfrica Johannesburg, April 2017

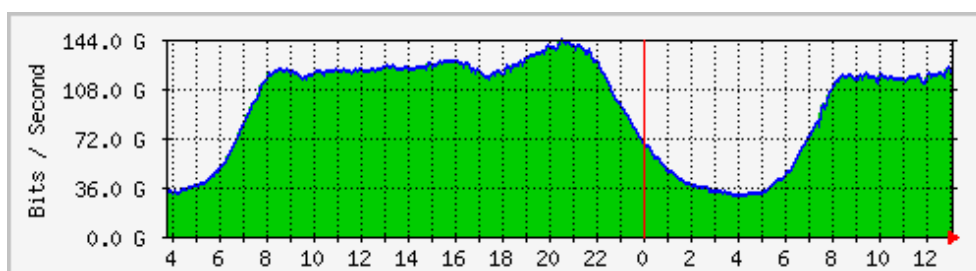
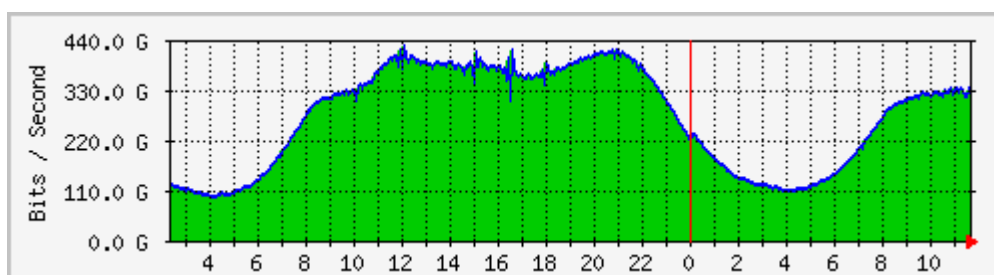


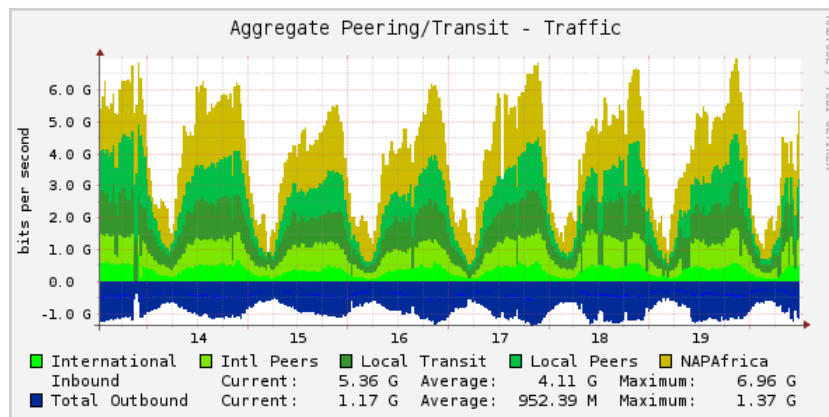
Figure 8: Inbound traffic, NAPAfrica Johannesburg, July 2018



Source: <https://www.napafrika.net/>

As a result of these market dynamics, the costs of upstream internet access (paid-for transit) incurred by smaller (typically 'downstream') ISPs has fallen dramatically, and now accounts for a relatively small proportion of downstream ISP costs. For example, Cool Ideas, an ISP that has benefited from the rollout of approximately half a million fibre to the home connections by more than two dozen 'open-access' fibre providers, now delivers most of its traffic via peering links (see Figure 9 below).

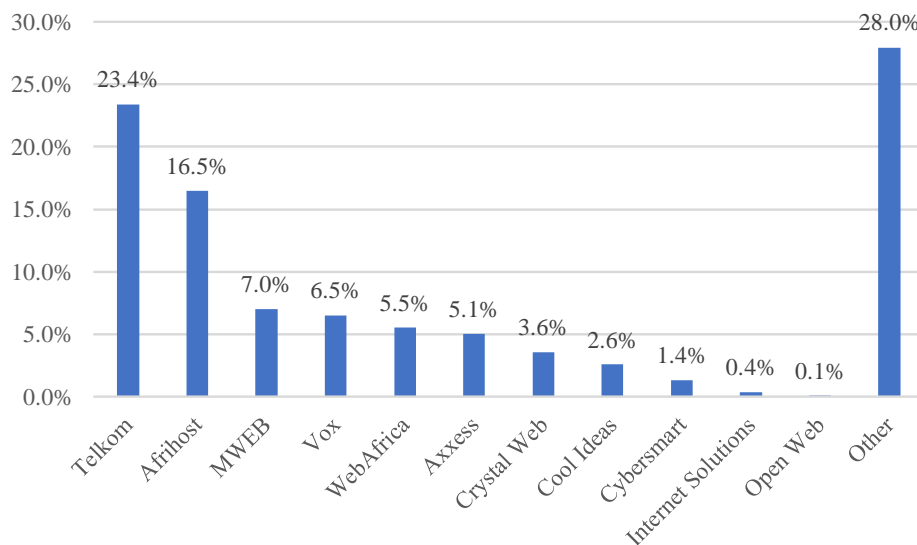
Figure 9: Peering vs transit traffic at Cool Ideas (2017)



Source: <https://www.cisp.co.za/network/>

Showmax and Netflix both host content at NAPAfrica Johannesburg which makes it easy for local ISPs to peer with them and improves user experience. Netflix also caches content on certain larger ISP networks directly (which Comcast and other large ISPs objected to in the US). Developments like this further illustrate the lack of ISP market power in the current environment. A 2017 survey of consumers found that of those who used a subscription streaming service, the largest proportion (23.4%) used Telkom as their ISP followed by AfriHost (16.5%) and MWeb (7.02%). The market shares of ISPs used for subscription streaming services do not indicate a highly concentrated market (Figure 10).

Figure 10: ISP used for subscription streaming services according to MyBroadband survey, 2017



Source: MyGaming (2017), available [here](#)

When it comes to content, Section 2 illustrates that markets for the supply of content over the internet in South Africa are competitive. Also important is the fact that in South Africa, vertical integration between content providers and ISPs does not exist for the most part. Telkom, the fixed-line incumbent, set up a media subsidiary, Telkom Media, in 2008, aiming to offer subscription-based television services via satellite, broadband and the web. However, the operation was unsuccessful and was wound

up in March 2009.⁶ MTN invested in developing its own video-on-demand service, but this did not prove popular and was also closed down. Even if MTN had retained its VOD service, it would have been unlikely to be in MTN's interest to degrade the quality of Netflix or ShowMax for example in order to favour its own content, since customers would be likely to switch to an alternative internet access provider which allows them to watch their preferred content uninterrupted. Historically, there has been vertical integration between ISP MWeb and content provider Multichoice (ShowMax), however, this ended with the sale of M-Web to Internet Solutions (which is not active in content provision.)

Cell C launched a streaming service, Black, in November 2017 and in May 2018 announced that Cell C subscribers would receive free data for use with Black until August 2018. This puts Black at a cost advantage relative to other streaming services for Cell C subscribers but given the relatively small market share of both Cell C and Black in their relevant markets, this is unlikely to be cause for concern from a competition perspective. To the extent that the Black offering strengthens Cell C's position in the market for mobile services, this would also likely be pro-competitive, weakening the dominance of incumbents Vodacom and MTN.

It is possible that in future, large ISPs such as Telkom and Vodacom could grow their content streaming platforms, but similar to the MTN and Cell C examples discussed above, this content would have to be extremely appealing and competition between ISPs much more limited for there to be a threat of the vertically integrated player trying to exclude its content rivals through throttling delivery of their content. Table 3 illustrates that the offerings of vertically integrated ISPs such as Vodacom and Cell C do not yet seem to be as popular as those of the standalone content providers.

In this competitive environment, it is also difficult to see how negotiated zero-rating and other preferential deals between content providers and ISPs could lead to anti-competitive effects, and they likely provide substantial benefits to consumers. Several mobile operators have recently offered special "zero-rating" deals for social media OTT services. For example, Cell C, MTN, Telkom Mobile and FNB Connect have offered promotions providing subscribers with free WhatsApp and Twitter, and Vodacom offers a basic version of Facebook (where photographs and other data-intensive media do not display) for free. Telkom LIT provides subscribers on certain plans with 50GB in addition to their included data to use for streaming Showmax, Google Play or DStv Now. Customers outside those plans can buy the same package for R231 per month. In addition, the streaming platform subscriptions can be added to the customer's Telkom bill. Vodacom offers customers data bundles specifically for streaming a variety of platforms including Netflix, Showmax and DStv Now. It recently offered a special sports bundle during the football World Cup for streaming sports channels via DStv Now. MTN has bundles available for YouTube. Cell C has zero rated its streaming service, Black, as discussed above. In the context of low levels of internet adoption and affordability in South Africa, these developments are likely to be positive from a policy perspective.

In addition, the relatively competitive market at the ISP level means that the possibility for such arrangements is likely to drive competition to provide better access to content which consumers want, rather than resulting in content providers being excluded. In future, if the ISP market becomes more concentrated or if a higher degree of vertical integration between content providers develops, then there may be greater cause for concern.

A further potential benefit to consumers of the growth of streaming services in South Africa is in creating competition to the incumbent pay TV provider, Multichoice. While most South Africans still access content through traditional broadcasting and satellite, increasing numbers are turning to internet-

⁶ Fin24, 25 March 2009. Telkom Media closes doors. Available [here](#).

based services as an alternative. Supporting this argument is the claim by Multichoice that it lost over 100,000 premium subscribers in South Africa in the last financial year, which it attributes to competition from streaming service, Netflix.⁷ At present therefore it seems that the growth of streaming offerings, including vertically integrated and bundled offerings, is likely to be highly pro-competitive.

4. Conclusions

The net neutrality debate developed from a very specific set of circumstances and concerns, from the massive growth in traffic from certain content providers and, more importantly, from the position of large, powerful ISPs which control access to the consumer and also compete in content markets. In this context, concern around the ability of ISPs to discriminate against competing content may be valid. Even in those circumstances, economics is undecided on whether net neutrality rules will increase or decrease welfare and so far, the literature has been unable to provide support for a blanket rule as opposed to a case-by-case consideration of firms' conduct. Where there are competitive internet access and backbone markets, there is less reason for concern and consequently an even weaker rationale for regulation. What is clear is that a one-size-fits-all approach is unlikely to be optimal, and that the competitive conditions in a particular context should be analysed before coming to any conclusions on the need for net neutrality rules.

South Africa has relatively competitive internet access and backbone markets currently (note that this is different to underlying infrastructure markets, which are less competitive), as well as competitive markets for content over the internet. In these circumstances, it is hard to see how competition or consumers could be harmed by discrimination between content. Critically, the ability of consumers and content providers to switch between content delivery channels if they are unhappy with the conduct of ISPs, reduces the ability of ISPs to engage in anti-competitive conduct. In addition, there are potentially large benefits to consumers from practices such as bundling and zero-rating of certain content with the purchasing of internet access, and this may assist to stimulate competition in adjacent markets such as mobile services and broadcasting, further raising total welfare. Overall therefore, it is hard to make a compelling case for the imposition of net neutrality rules in South Africa. This chimes with the views of stakeholders, which overwhelmingly highlight the lack of concerns around net neutrality in the market currently.

This suggests that net neutrality rules are not necessarily needed, nor even useful, in developing countries like South Africa. Rather, this paper has illustrated the importance of taking into account the features of individual markets, in particular carefully considering market power and the likelihood of exclusionary conduct on the part of ISPs.

⁷ Business Day, 12 July 2018. 'Multichoice calls for Netflix to be regulated'. Available [here](#).

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