

GENERAL NOTICE

NOTICE [X] OF 2019

INDEPENDENT COMMUNICATIONS AUTHORITY OF SOUTH AFRICA



DISCUSSION DOCUMENT ON THE MARKET INQUIRY INTO MOBILE BROADBAND SERVICES IN SOUTH AFRICA

1. The Independent Communications Authority of South Africa ("the Authority"), hereby in terms of section 4B of the Independent Communications Authority of South Africa Act, 2000 (Act No. 13 of 2000) ("ICASA Act"), read with section 67 of the Electronic Communications Act, 2005 (Act No. 36 of 2005), and read with a notice published in Government Gazette No. [] (Notice No ...) of 16 November 2018¹ publishes the Discussion Document on the Market Inquiry into Mobile Broadband Services in South Africa.

¹ Notice of intention to conduct Market Inquiry into Mobile Broadband Services (the "Notice") in terms of section 4B of the Independent Communications Authority of South Africa Act No.13 of 2000, read with section 67(4) of the Electronic Communications Act No.36 of 2005

2. A copy of the Discussion Document, is available on the Authority's website (<https://www.icasa.org.za>) and at the Authority's head office library (Block C, 350 Witch-Hazel Avenue, Eco Point Office Park, Eco Park, Centurion) during office hours (Mon-Fri from 09:00 to 16:30).
3. Interested persons are invited to submit written representations with regard to the Discussion Document, by no later than forty-five (45) working days after publication of this document by post, hand delivery or electronically (in Microsoft Word) and marked specifically for the attention of Councillor Botlenyana Mokhele, Mobile Broadband Service Inquiry Committee at: ICASA, Block B, 350 Witch-Hazel Avenue, Eco Point Office Park, Eco Park, Centurion or E-mail: MarketInquiry2018@icasa.org.za. **Responses should follow the sections set out in the report, where the section is relevant to the interested person.**
4. All written representations submitted to the Authority pursuant to this notice will be made available for inspection by interested persons at the Authority's library and copies of such representations will be obtainable on payment of the prescribed fee.

5. At the request of any person who submits written representations pursuant to this notice, the Authority will determine whether such representations or any portion thereof is confidential in terms of section 4D of the ICASA Act. If the request for confidentiality is refused, the person making the request will be allowed to withdraw such representations or portion thereof. Persons requesting confidentiality are urged to acquaint themselves with the ICASA Guidelines for Confidentiality Request published in Government Gazette No. 41839 (Notice No. 849) of 17 August 2018.



DR Keabetswe Modimoeng

Acting Chairperson

DATE: 29 November 2019



**DISCUSSION DOCUMENT ON THE MARKET INQUIRY INTO
MOBILE BROADBAND SERVICES IN SOUTH AFRICA**

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1 Executive summary

- 1.1. The Independent Communications Authority of South Africa (“the Authority/“ICASA”) is conducting an inquiry into mobile broadband services offered by mobile network operators (“MNOs”) in South Africa. Mobile broadband or mobile data services (these terms are used interchangeably in this inquiry) are part of a suite of services offered by MNOs, which include voice and data services.
- 1.2. The Authority identified one retail market for mobile services, and four wholesale markets for: (i) spectrum, (ii) site access, (iii) roaming and (iv) mobile virtual network operator (“MVNO”)/wholesale access point name (“APN”) services. In each market, the Authority assesses (i) relevant markets, (ii) effectiveness of competition, (iii) whether any licensees have significant market power and (iv) pro-competitive licence conditions. The Authority then considers (v) a schedule for periodic review and finally (vi) the approach to monitoring and investigation. These markets were arrived at using the priority markets study as a starting point and evaluating research, submissions from stakeholders and data as set out in the remainder of this document.
- 1.3. A brief overview of the Authority's preliminary findings in respect of each market is provided below:
 - 1.3.1. Retail market: The Authority identified a retail product market for mobile services. While there may be separate markets for voice, SMS and data services, the competitive dynamics are similar across these markets, and they are therefore aggregated for analysis. The Authority considered retail geographic markets for mobile services that are at least as narrow as the local and metropolitan municipality level. This is based on (i) the fact that consumers can only use services that are available to them in the area in which they use the mobile service and on (ii) evidence that competitive dynamics vary considerably at the local level. There is market share and

retail price evidence that suggests that these markets are ineffectively competitive in many cases. Vodacom is dominant in 110 municipalities, MTN is dominant in 78 municipalities and MTN and Vodacom both have a share of 45% or more in 4 municipalities. Cell C has a market share of 45% in one local municipality, and 41 municipalities do not have a dominant operator. The Authority considers that entry barriers into retail markets are considerable since wholesale services are not supplied competitively. This is the case both in respect of facilities-based entry and services-based entry. The market for site access in particular is highly concentrated in many municipalities (discussed below), full-coverage roaming services are only offered by two operators, and only one operator offers MVNO services. The Authority considers that remedies in respect of these wholesale markets are appropriate to resolve ineffective competitive markets at the retail level.

- 1.3.2. Upstream market 1, spectrum: The Authority considers a national market for spectrum, an important input for the supply of mobile services. While the supply of spectrum is limited, there are no licensees that have substantially greater holdings than other licensees, and there are no licensees that have significant market power in this market.
- 1.3.3. Upstream market 2, site access: the Authority considers a market for site access that is at least as narrow as local and metropolitan municipalities. This market is ineffectively competitive, with very high levels of concentration in 226 out of 234 municipalities, where the Herfindahl Hirschman Index ('HHI') is above 2000. Vodacom is dominant in 104 municipalities by itself, MTN is dominant in 18 by itself, and MTN and Vodacom are both dominant in 2 municipalities. Telkom is dominant in 11 municipalities, and in 99 municipalities no operator has a dominant share. The proposed remedy to the observed impediments to competition in the site access market in South Africa is the re-drafting of facilities leasing regulations as contemplated by the Electronic Communications Act, 2005 (Act No. 36 of 2005) ("**ECA**"), together with more detailed guidelines. This

would include a requirement to publish site information online, a time limit for the consideration of requests and rules around when site sharing should be considered technically and economically feasible. It would preclude the indefinite reserving of space on masts for the incumbent's equipment and facilitate the quicker roll out of new sites by smaller operators. Accounting separation is also considered as a remedy, to improve transparency and enable monitoring by the Authority.

- 1.3.4. Upstream market 3, roaming: The Authority considers a market for roaming services that has a geographic dimension at least as narrow as local and metropolitan municipal areas. This is based on, among other factors, the nature of roaming agreements in South Africa which have geographic limitations. These markets are ineffectively competitive as only MTN and Vodacom have substantial coverage in many municipalities. From a network capacity perspective, measured by number of network sites, MTN is dominant (has a market share of 45% or more) in 34 local and metropolitan municipalities, Vodacom is dominant in 86 and MTN and Vodacom both have a market share exceeding 45% in 15 municipalities. The Authority considers the following pro-competitive licence conditions as appropriate in the circumstances: (i) Mandating a roaming offer for parties dominant in particular geographic areas. (ii) Accounting separation: At this stage the market is changing and as such price regulation may be premature. However, in order to enhance transparency and ability for the regulator to monitor, accounting separation should be implemented. This is to split out all network related inputs needed to provide roaming as though the dominant operator used roaming as an input when providing its own retail services.
- 1.3.5. Upstream market 4, MVNO and APN services: The Authority does not definitively define markets, assess the effectiveness of competition and significant market power and consider pro-competitive licence conditions where MVNO and APN services are concerned since any competition concerns in this layer can be remedied upstream at the site access and

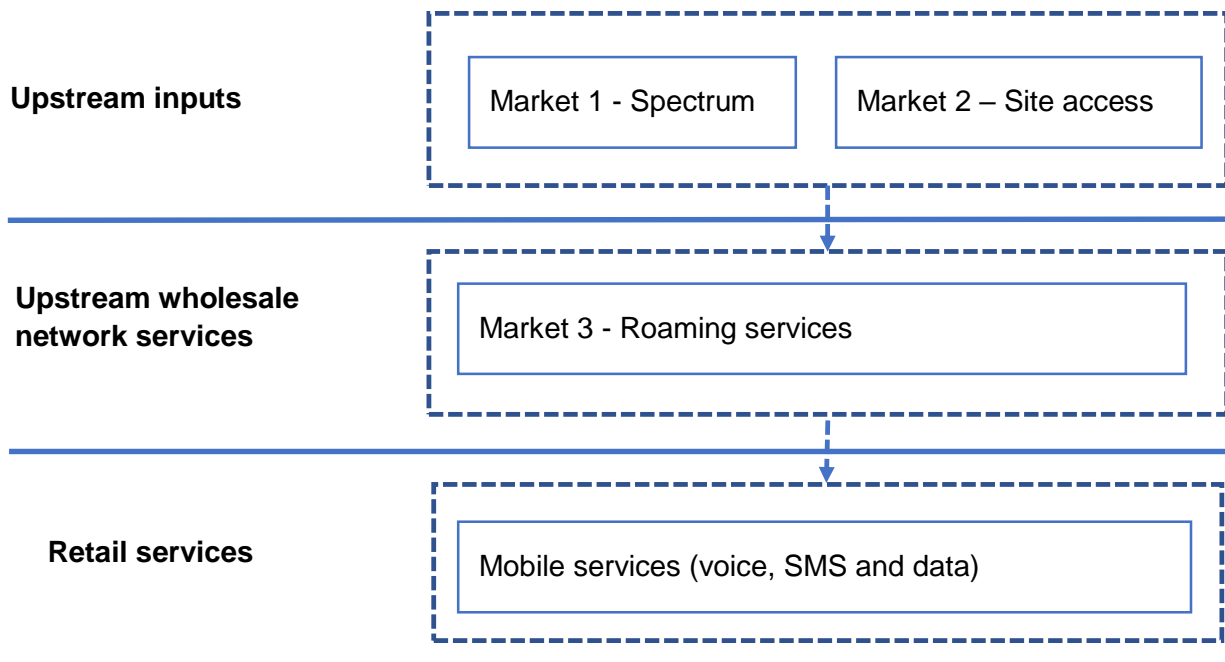
roaming layers. Nonetheless, concerns have been raised in respect of MVNO and APN services. The Authority analyses MVNO and APN services together, since they can be used as substitutes by MVNO and reseller customers to some extent. There are indications that the supply of these services is ineffectively competitive since there is at present only one provider of wholesale MVNO services even though all MNOs could offer these services and APN prices are high relative to retail prices. While the Authority is concerned about ineffective competition in markets for MVNO and APN services, the Authority does not make a finding in respect of market power in this market. Any market power in the provision of MVNO and APN services is a result of market power at the sites and roaming levels and is likely linked to dominance in retail markets. Remedies imposed in those markets are likely to mitigate any market power for MVNO and APN services and there is therefore no need to conclude on market power in respect of MVNO and APN services. The Authority considers that the remedies in markets for site access and roaming services are likely to improve competition in markets for MVNO and APN services. The Authority will monitor progress in the supply of MVNO and APN services while these remedies are in force and reassess whether further intervention is needed if the upstream remedies are not effective.

2. Introduction

- 2.1. On 17 August 2018 the Authority concluded the Inquiry into priority markets in the electronic communications sector and published findings document on priority markets,² wherein the Authority made a finding that, *inter alia*, broad market for mobile services will be prioritised for a market inquiry.
- 2.2. This market inquiry into mobile broadband services, therefore, follows the conclusion of the priority markets Inquiry.
- 2.3. Mobile broadband or mobile data services are part of a suite of services offered by MNOs, which include voice and data services. These services require common inputs, including radio frequency spectrum and high sites where infrastructure-based entry is considered or roaming or MVNO and APN services where services-based entry is considered (see Figure 1). Each of these segments of the value chain can be considered in the context of network sharing.

² Government Gazette 41847

Figure 1: value chain



- 2.4. Network sharing is an important means by which mobile services are offered in South Africa. Network operators are able to share elements of their networks with one another, and this is becoming increasingly common internationally. This trend has largely been driven by the transition from voice to data which has meant that operators are facing declining revenues with the same or greater infrastructure investment and maintenance costs.³
- 2.5. Two main types of sharing are possible. Passive infrastructure sharing entails sharing “passive” network elements such as the site and mast,

³ Mölleryd, Bengt G.; Markendahl, Jan (2013) : *The role of network sharing in transforming the operator business: Impact on profitability and competition*, 24th European Regional Conference of the International Telecommunication Society, Florence, Italy, 20-23 October 2013. Available [here](#).

whereas active sharing refers to the sharing of “active” network elements such as antennae, RAN etc.⁴ Infrastructure sharing is very widely used in Europe as a way of reducing infrastructure costs. A survey of 27 EU member states showed that there are agreements for passive network sharing in all member states and active network sharing is used in several countries.⁵

- 2.6. Site sharing refers to a situation where operators co-locate sites but install and operate their own equipment at the site. Mast sharing involves a further step to share masts. RAN sharing is the most comprehensive form of access network sharing and involves the sharing of all access network equipment including antenna, mast and backhaul equipment. However, operators still maintain separate logical networks and spectrum . This form of sharing may lead to substantial savings in network operating costs.⁶ Core network sharing involves the sharing of the transmission ring or core network logical entities. The rationale for core network sharing is not as clear as for access sharing as there may be some cost reductions in terms of operations and maintenance but the scale and practicality of these are not clear.⁷
- 2.7. Network roaming occurs when traffic from one operator’s subscriber is carried and routed on another operator’s network. This only requires an agreement between operators and no shared investment in infrastructure is necessary. This type of sharing may be useful in areas of low density where investments in several competing sets of infrastructure may not be viable. MVNOs provide mobile services without owning mobile frequencies or

⁴ GSMA (2012). *Mobile Infrastructure Sharing*. Available [here](#).

⁵ Bureau of European Regulators for Electronic Communications (2011). *BEREC-RSPG report on infrastructure and spectrum sharing in mobile/wireless networks*. Available [here](#).

⁶ GSMA (2012).

⁷ GSMA (2012).

mobile access networks. They essentially resell wholesale minutes and / or GB of data purchased from an infrastructure owner (a mobile network operator, or MNO). In South Africa, a further form of network sharing has developed via APNs, whereby internet service providers (ISPs) are able to use the mobile operators' network to connect to customers but use the ISP's internet connectivity and possibly other managed network connectivity (such as for a corporate virtual private network) in order to provide services to customers.

- 2.8. In 2011 and 2012, the UK regulator Ofcom held consultations on the assessment of future mobile competition and proposals for the award of 800MHz and 2.6GHz spectrum and related issues. In its report on the second consultation,⁸ Ofcom explains its viewpoint that the wholesale level is particularly important for competition. This is since it is the wholesale level which determines quality, and competition between national wholesalers tend to stimulate competition at the retail level both directly (where wholesalers are also retail competitors) and indirectly (where non-wholesalers can obtain access to wholesale services on terms which enable them to be effective retail competitors).
- 2.9. Further to this, Ofcom notes that if retailers are able to obtain national wholesale access on terms that allow them to be competitive, barriers to entry at the retail level are likely to be relatively low. However, if the wholesale market were to develop such that it was difficult for retailers to obtain wholesale access to national networks, this would mean that barriers to entry to the retail market are much higher, as players would have to enter the wholesale market in order to compete in the retail market.

⁸ Ofcom 2012. Second consultation on assessment of future mobile competition and proposals for the award of 800 MHz and 2.6 GHz spectrum and related issues, Annex 6: Revised Competition Assessment.

- 2.10. Therefore, wholesale services relating to network sharing including site access, roaming, and MVNO and APN services play an important role in this inquiry.
- 2.11. The remainder of this document is set out as follows. First, the legal process and approach is discussed. Next, retail markets are discussed. This is followed by a series of discussions on wholesale markets, including spectrum, site access, national roaming and MVNO and APN services.

3 Approach

This section outlines the approach used by the Authority to: (1) identify and define relevant markets in the provision of mobile broadband services, (2) determine the effectiveness of competition in the relevant markets, (3) determine licensees with significant market power, and (4) identify suitable pro-competitive remedies where competition is found to be ineffective.

3.1 Market definition

1. Section 67(4)(a) of the ECA requires that:

"The Authority must, following an inquiry, prescribe regulations defining the relevant markets and market segments and impose appropriate and sufficient pro-competitive licence conditions on licensees where there is ineffective competition, and if any licensee has significant market power in such markets or market segments. The regulations must, among other things—

(a) define relevant wholesale and retail markets or market segments"

2. Market definition is a tool used by regulators to identify the set of products or services which exert a competitive constraint on one another. In the present proceedings, this allows regulators to analyse the effectiveness of competition, and whether any firms have market power. Market definition generally involves assessing the competitive constraints faced by firms by analysing the extent to which customers can substitute to competing alternatives in response to an increase in price or reduction in the quality of a good or service.
3. The standard approach to defining markets is a conceptual approach known as the hypothetical monopolist or small but significant non-transitory increase in prices ("SSNIP") test. The SSNIP test involves asking, starting from a narrowly defined relevant market: would a hypothetical monopolist be able to profitably increase prices by a small but significant amount for a non-transitory period? The rule of

thumb typically used for the hypothetical price increase is between five and ten percent. Market definition has both product and geographic dimensions.

4. In markets with differentiated products, it can be difficult to draw hard competition boundaries around groups of products and the focus is therefore on analysing the closeness of competition between different products in terms of whether consumers perceive them to be close substitutes. The more closely two products compete, the more likely that the suppliers constrain one another from a competition perspective. Another feature of differentiated markets is that products which do not compete directly with one another may still exert some competitive constraint over one another through what is called a “chain of substitution”. For example, although 10MB of data and 100MB of data may not seem like direct substitutes, both are likely to compete with 50MB of data to some extent and hence may constrain each other indirectly. It is therefore not always necessary to conclude on a hard and fast market definition and may be useful to analyse narrower markets but also to consider the extent of competitive constraints posed by products outside those markets, including via a chain of substitution.
5. In addition, while many products may not be substitutes from a demand-side perspective, there is utility in aggregating products for analytical purposes into one market if competitive dynamics are sufficiently similar.⁹
6. The extent of competitive constraints on licensees is determined by demand-side (customer) substitution, but also by the extent to which suppliers in adjacent markets could respond to an increase in price by entering the affected market, termed supply-side substitution. While there is consensus that this is an important dynamic to consider in a competitive assessment, authorities have differed in terms of where in the process they conduct this analysis. The US and UK authorities for example generally ignore supply-side issues from a market definition perspective but consider it later when analysing the likely competitive effects of a merger. The

⁹ See, for example, Niels, G., Jenkins, H., & Kavanagh, J. (2011). *Economics for competition lawyers*. Oxford University Press. See section 2.7.5.

relevant questions from an analytical perspective are: is entry going to be likely, timely and sufficient to constrain any anti-competitive effects?

7. In South Africa a similar approach has been taken. In the matter between Caxton and CTP Publishers and Printers Limited and the Competition Commission, Paarl Media (Pty) Ltd and Primedia (Pty) Ltd,¹⁰ the Competition Tribunal ('the Tribunal') stated that it had historically been of the view that supply-side substitution should be taken into account during the competitive analysis.¹¹ The Tribunal notes that there are arguments for and against both approaches, but that what ultimately matters is that the correct inquiry into whether entry is likely, timely and sufficient is made. It highlights that there can be analytical challenges with considering supply-side substitution at the market definition stage, cautioning that "When used at market definition stage this inquiry can be very wide and can lead to overinclusion".¹²
8. In this case, the Authority considered demand-side substitution in terms of defining the relevant markets, but supply-side issues are also important to a full understanding of competitive dynamics and have been considered where relevant in assessing the effectiveness of competition. As noted above, this is the analytically simpler approach, but does not affect the ultimate outcome of the analysis.

Question 1: In your opinion, is the above approach to market definition adopted by the Authority appropriate in defining the relevant markets? Motivate your response by providing reasons and any supporting evidence or data, as far as possible.

¹⁰ See the Tribunal's discussion of supply-side substitution in its decision in the case of *Caxton & CTP Publishes and Printers Ltd v Competition Commission and Others* in case number 13XFeb11, paragraph 45.

¹¹ Paragraph 45.

¹² Paragraph 53.

3.1.1 Effectiveness of competition (including entry barriers, market shares and significant market power)

9. The Authority is required, in terms of section 67(4)(b) of the ECA, when prescribing regulations and after defining relevant market, to:

"(b) determine whether there is effective competition in those relevant markets and market segments"

10. The ECA requires that a number of factors are considered when determining whether there is effective competition, including barriers to entry and market shares, among other factors, discussed in turn next.

3.1.1.1 Barriers to entry

11. Section 67(4A)(a) of the ECA requires that:

"When determining whether there is effective competition in markets and market segments, the Authority must consider, among other things—

(a) The non-transitory (structural, legal, and regulatory) entry barriers to the applicable markets or market segments."

12. While there are debates as to the economic definition of barriers to entry, economists typically consider the sunk costs of entry (costs that are not recoverable in the event of exit) and the profitability of entry to be the main determinants of new entry.¹³ There are further considerations, including whether entry barriers are predetermined or strategic in nature. Important concepts in relation to predetermined barriers to entry are minimum efficient scale ("MES") and minimum viable scale ("MVS"). MES is the scale of output to achieve the lowest average costs, and MVS is the scale needed for the firm to earn positive profits. If the market size is close to MES or MVS, then entry is less likely since the market can only accommodate a small number of firms. Incumbents may also employ a range of

¹³ See, for example, Bishop, S., & Walker, M. (2010). The economics of EC competition law. Sweet & Maxwell.

strategies to limit entry, such as by entering into exclusive supply deals with suppliers or customers, reducing potential demand for new entrants by advertising heavily, for example, or incurring other substantial sunk costs such as in research and development in order to raise the costs of entry. Barriers to expansion may be different to barriers to entry since it may be easier for an existing rival to expand capacity into new product ranges than for a new firm to enter the market.

13. The Competition Tribunal, when assessing barriers to entry, seeks to 'establish whether entry would be quick, effective and without the need for significant sunk investments'.¹⁴ The Tribunal further cites the US Horizontal merger guidelines, which asks whether entry would be 'timely, likely and sufficient'. Entry is typically considered timely if it would take place within two years.¹⁵ The likelihood of entry is evaluated by assessing the profitability of entry, typically at prevailing prices, and possibly assessing minimum viable scale. As discussed above, if minimum viable scale is at close to the market size, entry is unlikely. Entry also needs to be on a sufficient scale to defeat a SSNIP. Finally, it is important to consider regulatory barriers to entry, such as licensing and access to spectrum.

3.1.1.2 Market shares

14. An important means by which the effectiveness of competition is considered is by analysing market shares and levels of concentration. Section 67(4A)(b) of the ECA requires that:

"(4A) When determining whether there is effective competition in markets and market segments, the Authority must consider, among other things—

...

¹⁴ See the Competition Tribunal's decision in the matter between Caxton and CTP Publishers and Printers Limited and the Competition Commission, Paarl Media (Pty.) Ltd. and Primedia (Pty.) Ltd. (case number 13/X/Feb11, <http://www1.saflii.org/za/cases/ZACT/2011/54.html>.) Para 44.

¹⁵ See, for example, Bishop & Walker (2010), cited above.

(b) The dynamic character and functioning of the markets or market segments, including an assessment of relative market share of the various licensees or providers of exempt services in the markets or market segments, and a forward looking assessment of the relative market power of the licensees in the markets or market segments."

15. The Authority considered market shares in each of the identified relevant markets.

3.1.2 Significant market power (dominance, vertical integration and essential facilities)

16. The Authority is required, in terms of section 67(4)(c) of the ECA, when prescribing regulations and after defining relevant markets and assessing the effectiveness of competition, to:

"(c) determine which, if any, licensees have significant market power in those markets and market segments where there is ineffective competition"

17. In terms of section 67(5) the Electronic Communications Act:

"A licensee has significant market power in a market or market segment if that licensee—

(a) is dominant

(b) has control of an essential facility; or

(c) has a vertical relationship that the Authority determines could harm competition"

18. Section 1 of the ECA states that -

"dominant" has the same meaning given to that term in section 7 of the Competition Act, : 1998 (Act No. 89 of 1998). In terms of section 7 of the Competition Act a dominant firm has market share of:

at least 45%; or

at least 35%, but less than 45%, unless it can show that it does not have market power; or

less than 35% with market power."

19. Each of these factors were considered in each of the retail and wholesale markets below.

Question 2: Do you agree with the Authority's approach to the evaluation of effective competition? If not, motivate your response by providing comprehensive reasoning thereof.

Question 3: Are there other factors that the Authority should take into account when determining whether there is effective competition in the identified relevant markets?

3.1.3 Remedies

20. The Authority is required in terms of section 67(4)(d) of the ECA to:

"(d) impose appropriate pro-competitive licence conditions on those licensees having significant market power to remedy the market failure"

21. Section 67(7) of the ECA prescribes that:

"Pro-competitive licence terms and conditions may include but are not limited to—

(a) obligations in respect of interconnection and facilities leasing in addition to those provided for in Chapters 7 and 8 and any regulations made in terms thereof;

(b) penalties for failure to abide by the pro-competitive licence conditions;

(c) obligations to publish any information specified by the Authority in the manner specified by it;

(d) obligations to maintain separate accounting for any services specified by the Authority;

(e) obligations to maintain structural separation for the provision of any services specified by the Authority;

(f) rate regulation for the provision of specified services, including without limitation price controls on wholesale and retail rates as determined by the Authority, and matters relating to the recovery of costs;

(g) obligations relating to accounts, records and other documents to be kept, provided to the Authority, and published...”

4 Retail markets

4.1 Relevant markets

4.1.1 Priority markets study

22. The Authority identified a broad market for retail supply of mobile services and the wholesale supply of mobile network services, including relevant facilities during the course of the priority markets identification process.¹⁶
23. The Authority therefore considered a broad market in the priority markets Inquiry . In the present inquiry, the Authority also considered a broader product market for mobile services, discussed next.

4.1.2 Product markets

24. Mobile network prices and product attributes in South Africa are differentiated, and vary depending on the customer segment (such as business, postpaid consumer, prepaid consumer), product concerned (such as SMS, data and voice) and by geography (discussed below in section 4.1.3). It may be that there are narrow, separate markets for different mobile services. For example, a mobile voice call or SMS cannot be used to connect to the Internet, and so mobile voice or SMS services would not constrain a hypothetical monopolist from raising the prices of data

¹⁶ See Findings Document On Priority Markets Inquiry In The Electronic Communications Sector, available at: <https://www.icasa.org.za/uploads/files/findings-document-priority-markets-inquiry.pdf>

services by 5-10%. It may be that data services constrain voice and SMS services to some extent since consumers may use, for example, WhatsApp over a data service as a substitute for traditional voice and SMS, but given that the focus of this inquiry is on data services, this question need not be assessed. In any event, as discussed below, consumers often buy traditional voice and SMS services even when they buy data services (discussed below). This is consistent with data being a complement rather than a substitute for voice and SMS.

25. While data services may be in a separate market, consumers often buy bundles of mobile voice, SMS and data services together. In order to assess this, the Authority considered datasets of individual transactions for a large sample of subscribers who bought data. Therefore, consumers often buy voice and SMS services in addition to data services from the same provider. The significant role that traditional voice and SMS services continues to play in South Africa is likely linked to the substantial proportion of individuals and households that do not have access to a data service, and therefore must be called via traditional voice and SMS services. According to Statistics South Africa, the *“percentage of households with access to the Internet at home, or for which at least one member has access to, or used the Internet”* was 64.7% in 2018.¹⁷ In more rural provinces such as Limpopo and the Eastern Cape, this percentage is considerably lower, at 46.2% and 55.3% respectively. Traditional voice and SMS services are therefore the main means of reaching a substantial proportion of consumers in South Africa, and this is likely to be the case in the short to medium term.
26. Furthermore, voice, SMS and data are typically available when purchasing a SIM card available in South Africa, and many devices offer the capability to use all three services. In addition, competitive dynamics are likely similar for mobile voice, SMS and data services. For example, they all require similar inputs such as radio

¹⁷ See Statistics South Africa, 2019, General Household Survey: <http://www.statssa.gov.za/publications/P0318/P03182018.pdf>

frequency spectrum and high sites or alternatively access via roaming or MVNO and APN services, as discussed in more detail below.

27. The Authority therefore aggregates the potentially separate markets for voice, data and SMS services and analyses them together. While the Authority considers an aggregated market for all retail mobile services, various specific aspects of the markets or market segments are analysed where relevant. In the context of this being an inquiry into mobile broadband services, the Authority analyses data services in some detail.
28. In respect of data products, prices vary by bundle validity period (such as hourly, daily, weekly or monthly), by bundle size (such as 10MB, 100MB and 1GB) and by customer segment. There is likely a chain of substitution that joins the various bundle sizes together in one market. The Authority therefore considers bundles of up to 5GB to be linked via a chain of substitution.
29. Fixed-line networks are relatively under-developed in South Africa, and provide services to approximately 2.2 million households¹⁸ out of around 17 million households.¹⁹ This suggests that fixed-lines, while playing an important role particularly for businesses and for high-volume usage, do not provide an alternative for most households in South Africa, and so fixed lines are not considered further in this inquiry.
30. In summary, the Authority considers an aggregated retail market for mobile services, which includes voice, SMS and data services.

¹⁸ Telkom, the largest fixed-line network, reported a total of 2.267m fixed lines as at March 2019: https://www.telkom.co.za/ir/apps_static/ir/pdf/financial/pdf/Telkom_Annual_Results_Booklet_2019.pdf

¹⁹ See Statistics South Africa General Household Survey 2018: <http://www.statssa.gov.za/publications/P0318/P03182018.pdf>

Question 4: Do you agree with the Authority's approach to aggregate the retail market for mobile services, which includes voice, SMS and data services? If not, motivate your response by providing comprehensive reasoning thereof.

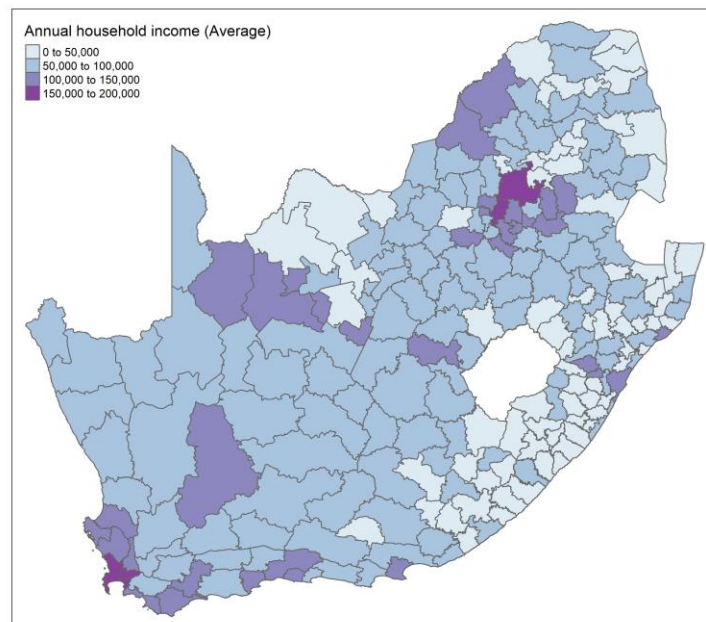
4.1.3 Geographic markets

31. From a geographic perspective, the Authority considers whether a hypothetical monopolist could profitably raise prices by between 5 and 10% in any given geography or whether consumers would be able to obtain services from outside the relevant geography, defeating such a price increase. This process begins with a relatively narrow geographic area, namely, local or metropolitan municipalities (there are 234 such geographic areas in South Africa). If a monopolist over mobile services existed in a municipality, the question is asked: could consumers use services outside of the municipality, constraining any price increase by the monopolist? The answer to this question is no, in that consumers could not use mobile services from outside of municipality in order to make calls, use data, etc. from within the municipality being considered. While an individual may make use of services in more than one local market (for example, home and work), there is no substitute in general from within a location. This means that there are narrow geographic for mobile services.
32. It is also important to note, from a geographic perspective, that MTN and Vodacom offer wide network coverage as well as market and distribute their services throughout South Africa, whereas Cell C and Telkom Mobile are predominantly in metropolitan areas. In theory, consumers can obtain a SIM card from any network throughout South Africa and can buy mobile services via a variety of channels to all networks. Consumers can also in principle use the Cell C and Telkom Mobile networks in most places in South Africa due to their roaming agreements with MTN and Vodacom respectively. In practice, however, some licensees may experience problems with handovers , and distribution of airtime outside of metro areas can be constrained. In addition, other local factors, such as the presence of friends and

family and on-net discounts for calls to such calling groups, may mean that consumers choose the largest operator in their local geographic area. Finally, the relatively high costs of national roaming (discussed in section 7) reduces the profitability of the marketing and distributing services cost centres for Cell C and Telkom Mobile, which means that consumers are presented with fewer choices in roaming areas. It can be noted that at least some roaming contracts differentiate pricing by categorising sites as metro, urban and rural and pricing differently for each of these categories, which also suggests different local dynamics.

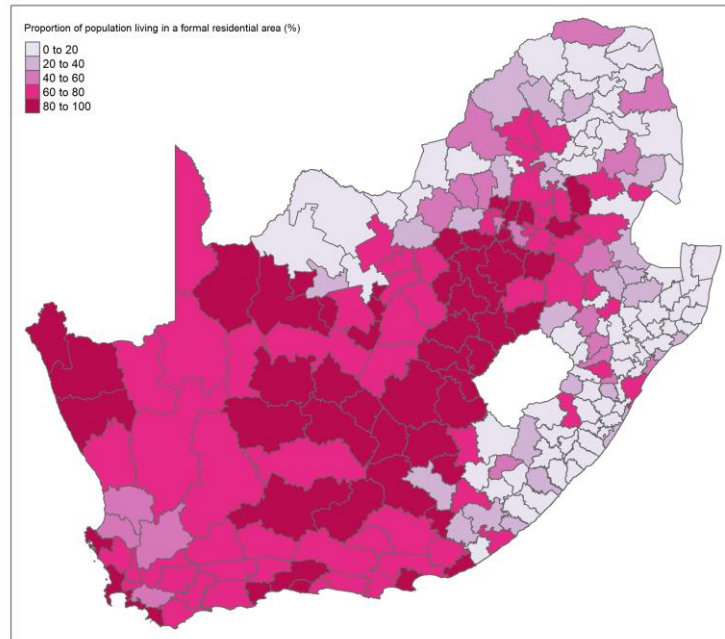
33. The geographic dimension of relevant markets is easily visible when considering prices, usage and costs that vary between geographical areas. Average prices and usage vary significantly by geography in South Africa, reflecting the underlying demographics (such as income, see Figure 2) of the different populations in each area and likely differences in costs of serving consumers such as the proportion of population living in a formal residential area rather than in traditional areas, on farms etc. (see Figure 3).

Figure 2: Annual household income (average, local and metropolitan municipality)



Source: Analysis of Statistics South Africa, South African Census Community Profiles 2011,
<https://www.datafirst.uct.ac.za/dataportal/index.php/catalog/517/study-description>

Figure 3: Proportion of population living in a formal residential area, by local and metropolitan municipality



Source: see Figure 2

34. Differences in demographics and cost factors by region are likely to result in differences in prices and usage across regions.
35. The significant variability in prices, usage and costs between different geographic areas in South Africa suggests that competitive dynamics vary significantly between areas. These factors support the Authority's finding that there are sub-national markets that are at least as narrow as the local and metropolitan municipality level.

4.2 Effectiveness of competition

4.2.1 Barriers to entry

36. The main barriers to entry are considered in relation to retail markets for mobile services in sections 5, 6, 7, and 8 below. In short, in order to enter retail markets for mobile services, a number of inputs are required, including spectrum

and sites and national roaming in respect of facilities-based entry, and MVNO or APN access in respect of services-based entry.

37. In respect of facilities-based entry, access to spectrum, sites and supplementary roaming are very high barriers to entry. This is because of the nature of spectrum assignments, the expense of rolling out new sites, the relatively limited extent of site sharing in South Africa, and the high costs of national roaming (discussed in sections 6 and 7 below). These barriers to entry contribute to the ineffective levels of competition in markets for mobile services in South Africa.
38. Additional barriers to entry include significant customer switching costs, which are exacerbated if number portability doesn't work well (see discussion in section 4.2.4). Substantial investments are also required in marketing and distribution networks, which are additional barriers to entry and expansion by rival networks.
39. In addition, there are legal barriers to entry in that an I-ECNS licence is required in order to enter markets for mobile services, and access at the services layer via APN or MVNO services are available only at high cost in the former case, and are only available from one operator in the latter case. This means that even at the services layer markets are ineffectively competitive. This is discussed in more detail in section 8 below.

4.2.2 Market shares

40. In what follows, the Authority considers market shares and market power at the national level as well as at the local and metropolitan municipal level. The Authority considers (i) levels of concentration and (ii) market shares of various licensees when assessing the dynamic character and functioning of the markets or market segments.

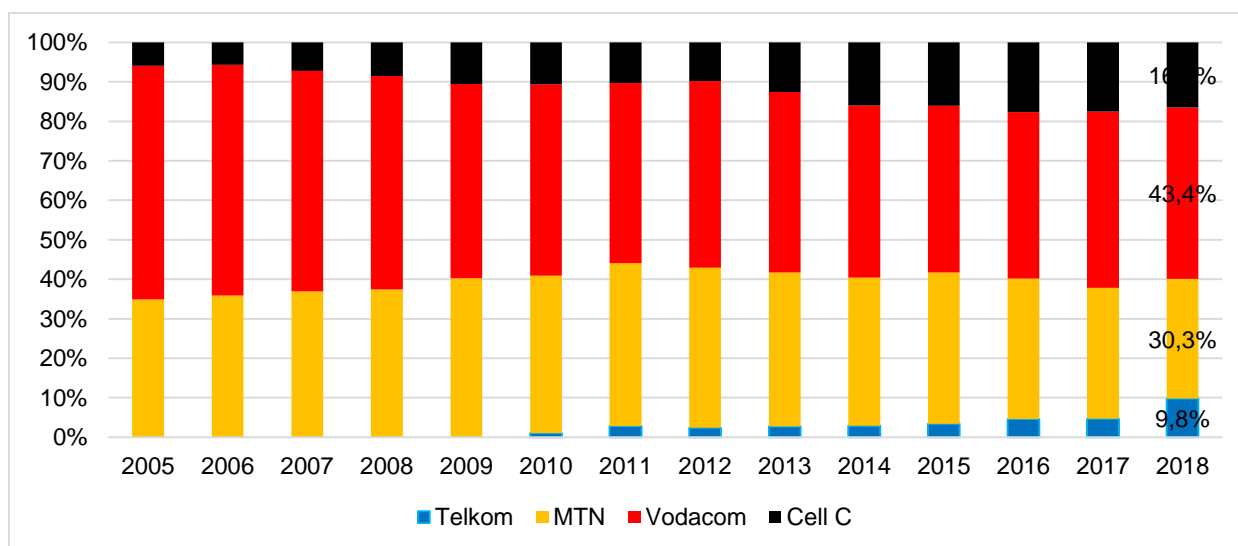
4.2.2.1 National

41. Markets for mobile services in South Africa are highly concentrated. In 2018, for example, concentration measured by the Herfindahl Hirschman Index ("HHI") was approximately 3,173 and two firms accounted for almost 75% of subscribers (see

Figure 4). The US Department of Justice refers to markets with an HHI less than 1500 as unconcentrated²⁰ and the UK's Competition and Markets Authority refers to markets that have an HHI of between 1000 and 2000 as concentrated and above 2000 as highly concentrated.²¹ These high levels of concentration have persisted over time, which suggests that any market power is unlikely to decline significantly over the medium term.

42. These high levels of concentration overall mask important variation between municipalities, where market shares are even higher in many cases. In the context of the very high market shares of individual licensees in many municipalities (discussed below), it is unlikely that the market power arising from these high market shares will decline significantly over the medium term.

Figure 4: Operator market shares measured by number of subscribers



Source: operator annual reports and public announcements

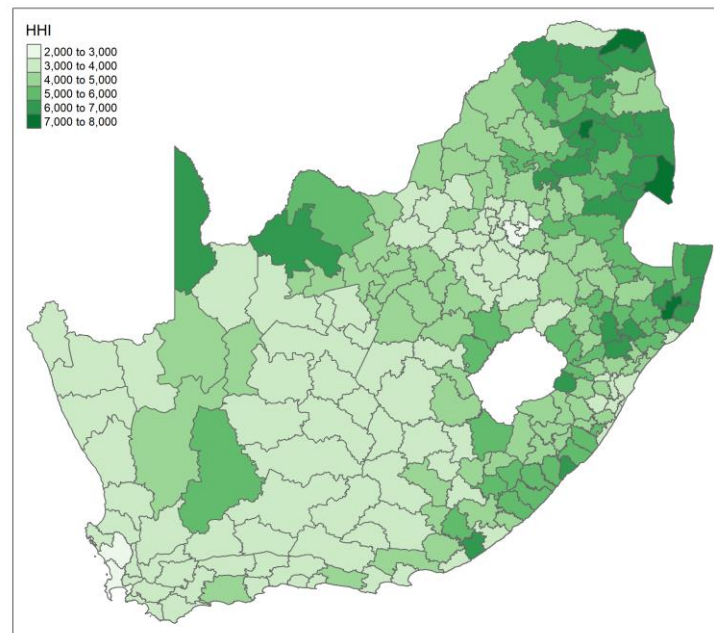
²⁰ See: <https://www.justice.gov/atr/horizontal-merger-guidelines-08192010#5c>

²¹ See: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/284449/OFT1254.pdf

4.2.2.2 Municipal

43. At the municipal level, markets are even more concentrated in many municipalities (see Figure 5). In particular, lower-income municipalities (municipalities outside of metropolitan areas) have significantly higher levels of concentration, especially in the northern and eastern parts of South Africa.

Figure 5: Hirfindahl-Hirschman Index, by local and metropolitan municipality



Source: Analysis of operator submissions

44. The considerable regional variation in levels of concentration is also apparent in respect of levels of market shares of individual operators.

4.2.2.3 Conclusions on market shares

45. The high relative market shares of individual licensees in many municipalities in South Africa suggests that there are a number of geographic areas characterised by ineffective competition. The high levels of concentration and lack of dynamism in market shares nationally over time suggests that these market shares are unlikely to change significantly over the medium term.

4.2.3 International comparisons

46. Another means of assessing the effectiveness of competition in the South African mobile data market is to compare outcomes in South Africa with those in other countries. Often such comparisons focus solely on price, however, it is also important to consider indicators of quality and other cost-drivers, as a wide range of factors other than competition can impact on mobile data prices. In the following section we begin by comparing mobile data prices in South Africa with those in a range of other countries before going on to supplement this with comparisons of available measures of quality and considering the impact of spectrum assignments and other country characteristics on price.

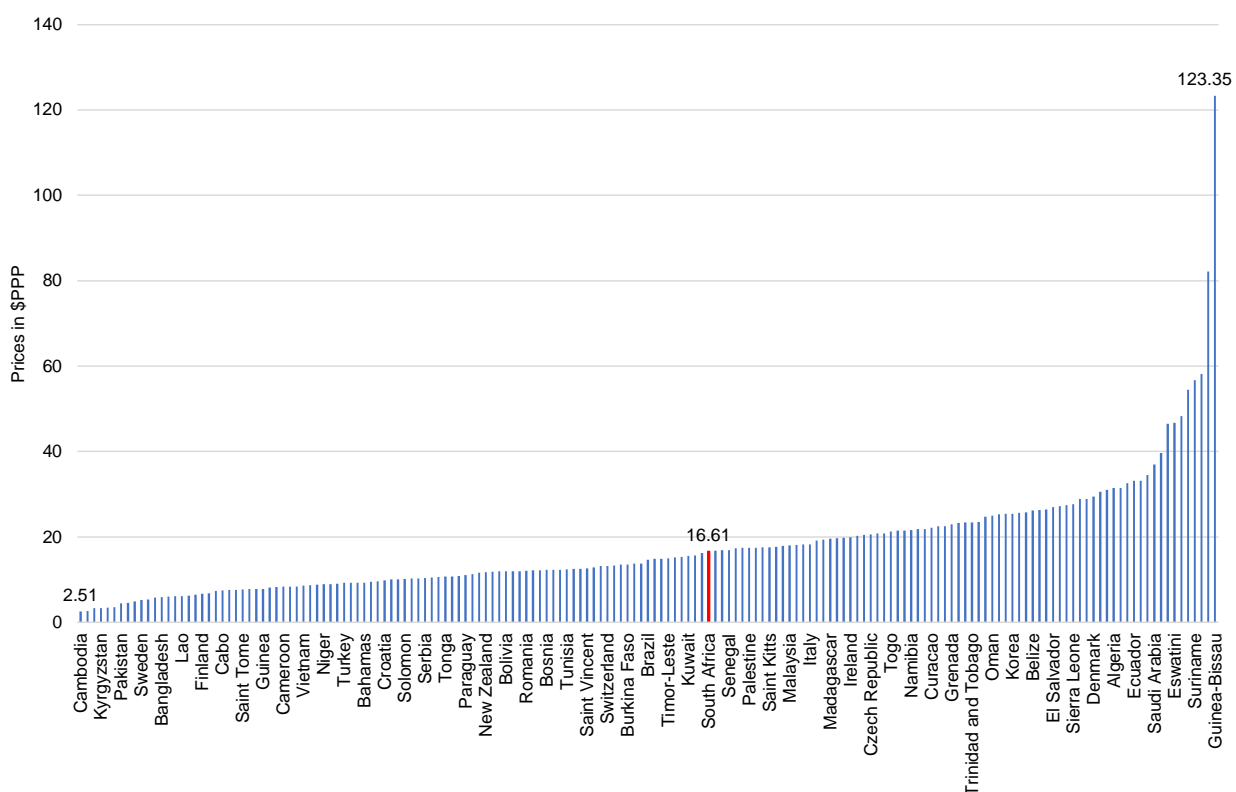
4.2.3.1 Price comparisons

47. There are a number of sources of international pricing data which have different benefits and challenges associated with them. In 2017, the ITU published a list of prices for a 500MB mobile basket based on prepaid, handset-based packages valid for 30 days in all countries, collected in 2016.²² It collects the prices for the least expensive plan fulfilling the criteria offered by the mobile operator with the highest market share in each country. This therefore represents the lowest prepaid price for a 30-day 500MB bundle offered by the largest incumbent. In South Africa, this would mean that Vodacom's price for a 500MB monthly bundle has been used. The ITU provides prices in PPP dollars which accounts for differences in purchasing power between countries and so provides a measure of the price of mobile data relative to other goods and services.
48. Figure 6 to Figure 8 illustrate how South Africa's price compares to that in world countries, African countries and BRICS countries respectively. South Africa performs around the level of the median country in the world, with a price of PPP\$16.61 compared to the cheapest country, Cambodia, with PPP\$2.51. In Africa,

²² This is the most recent pricing data available from the ITU.

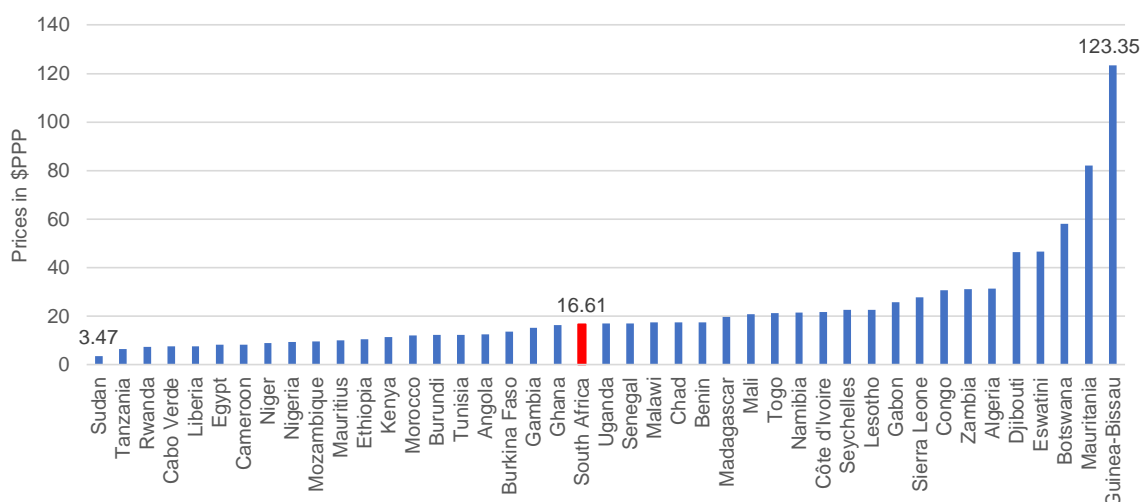
it performs slightly better, with lower prices than more than half of the countries. With respect to the BRICS countries, South Africa is the most expensive in PPP terms, slightly more expensive than Brazil and considerably more expensive than China, the cheapest country (PPP\$7.85.)

Figure 6: Price for a 500MB bundle (USD PPP): all countries, 2016



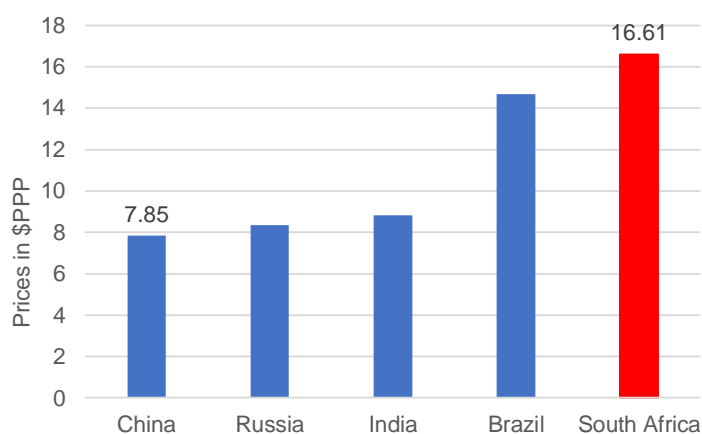
Source: ITU (2017). Available [here](#).

Figure 7: Price for a 500MB bundle (USD PPP): Sub-Saharan Africa, 2016



Source: ITU (2017). Available [here](#).

Figure 8: Price for a 500MB bundle (USD PPP): BRICS, 2016

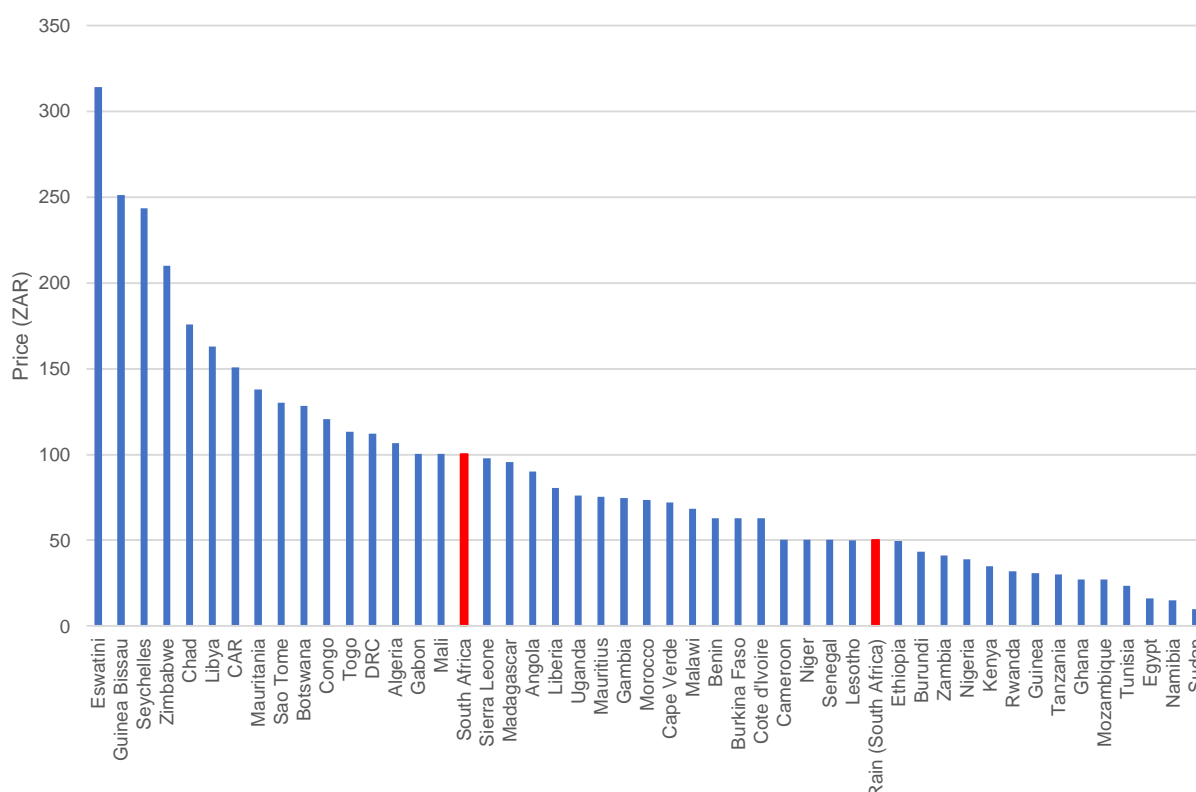


Source: ITU (2017). Available [here](#).

49. The ITU data suggests that South Africa's prices are not disastrously high but neither are they as low as they could be, particularly in comparison to South Africa's peers in the BRICS group. The major shortcoming of the ITU data is that it is quite outdated – the prices were collected in 2016 and data prices have likely changed substantially in the past three years.
50. Research ICT Africa collects prices for the cheapest prepaid broadband product providing 1GB of data per month for each African country each quarter. This means

that we can compare prices across Africa over time and the latest available data is for Q1 2019. Figure 9 illustrates that South African prices are quite high relative to the rest of Africa at R100/GB. The lowest prices are enjoyed in Sudan, Namibia and Egypt. This suggests that Research ICT Africa has used Telkom's R100/GB bundle as the cheapest product. Rain's R50/GB option has been excluded as it is a data-only offering focused only on the main metro areas, but if it is included it significantly improves South Africa's position in the international comparison as shown in Figure 9.

Figure 9: Price for a 1GB bundle (USD): Africa, Q1 2019

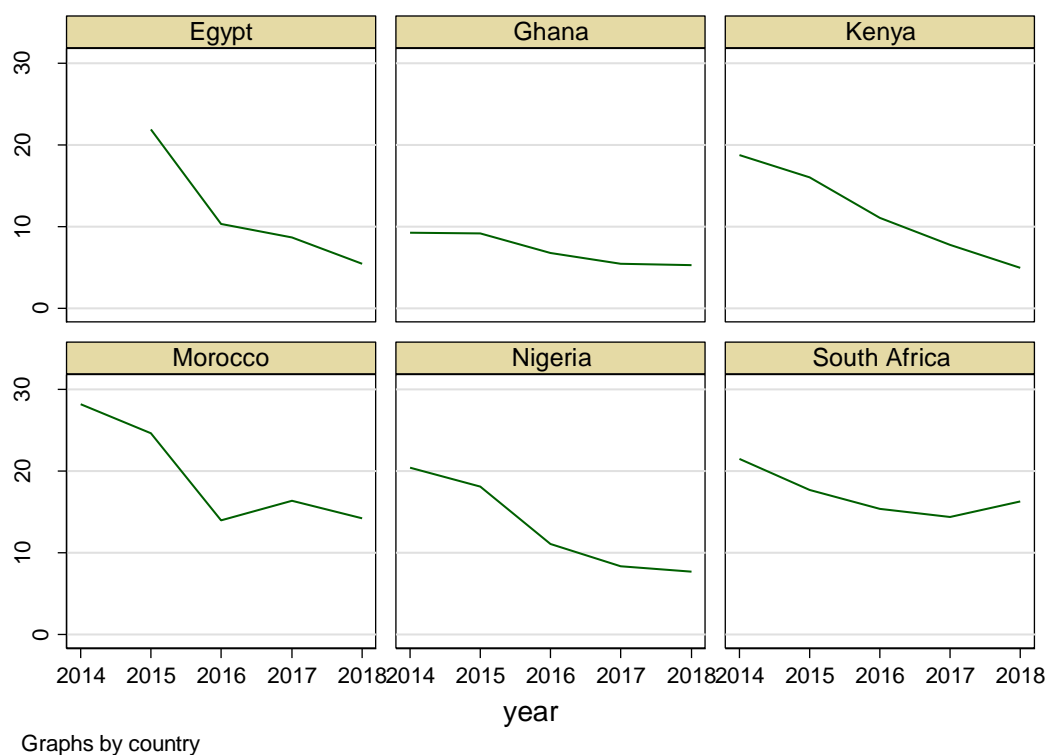


Source: Research ICT Africa (2019). Available [here](#).

51. Figure 10 looks at prices from 2014 to 2018 for six of the biggest economies in Africa: Egypt, Ghana, Kenya, Morocco, Nigeria and South Africa. Here the Authority has converted the USD prices into PPP\$ in order to alleviate the impact of changes in exchange rates on relative prices. This presents an interesting picture as it demonstrates that South Africa began the period with similar prices to the other

countries (except Ghana which was lower) and initially saw declining prices in line with the other countries. However, where most other countries saw continued price declines, South Africa's prices plateaued and even started to rise slightly on a PPP\$ basis. Morocco's prices have followed a similar trajectory. The result is that in 2018, South Africa's prices are substantially higher than those in Egypt, Ghana, Kenya and Nigeria. Again, however, it should be noted that Rain's R50/GB offer has not been included in determining the cheapest mobile broadband bundle in South Africa.

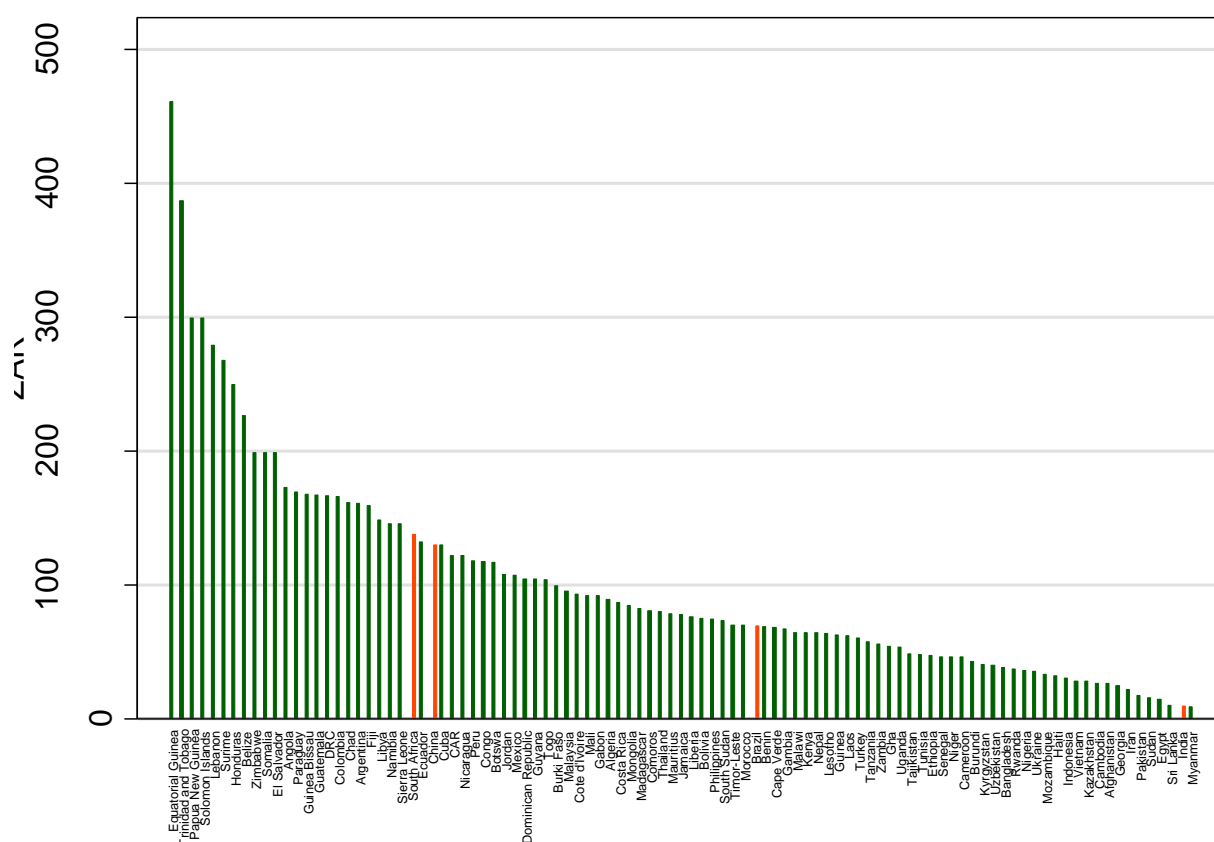
Figure 10: Price for a 1GB bundle (USD PPP): selected countries, 2014 - 2018



Source: Research ICT Africa (2019), available [here](#); exchange rates and PPP conversion factors from World Bank Development Indicators, available [here](#)

52. The Alliance for Affordable Internet uses the same methodology as the ITU to collect the cheapest handset-based mobile prepaid broadband plan per country²³ for a range of countries. In Q4 2018, it collected this data for 100MB, 500MB, 1GB, 2GB, 5GB and 10GB plans. Based on the price of a 1GB bundle from the largest operator, South Africa is again relatively expensive at R149/GB (Figure 11).

Figure 11: Price for a 1GB bundle (USD): A4AI countries, Q4 2018



Source: Alliance for Affordable Internet (2019). Available [here](#).

²³ That is, the cheapest plan(s) providing at least 1GB of broadband data over a 30-day period from the largest mobile network operator in each country.

53. In its response to the Competition Commission’s preliminary report on the data market inquiry, Vodacom analyses the A4AI data on the prices of different bundle sizes and shows that South Africa’s prices are more affordable for small bundles compared to large bundles.²⁴ Vodacom fails to explain, however, that A4AI notes a major caveat with regard to the prices for smaller data bundles:

“In some countries, smaller data bundles (e.g., 100MB) are not available and instead we identify the cheapest option to purchase that bundle. This may lead to the same price for several bundles. For example, in Argentina 100MB plans are not available from the largest operator, and so purchasing just 100MB of data would cost the same as purchasing 1GB.”²⁵

54. In fact, this applies to many of the countries in the sample and means that a comparison of South Africa with the other countries for a 100MB bundle is misleading. Out of 90 countries in the sample, 60 had no 100MB bundle available. 100MB prices are therefore overstated for two thirds of the sample. It also suggests that in many countries, the typical size of bundle purchased is larger than the bundles being purchased in South Africa, which is likely due to the fact that larger bundles are more affordable in other countries.

4.2.3.2 Non-price factors

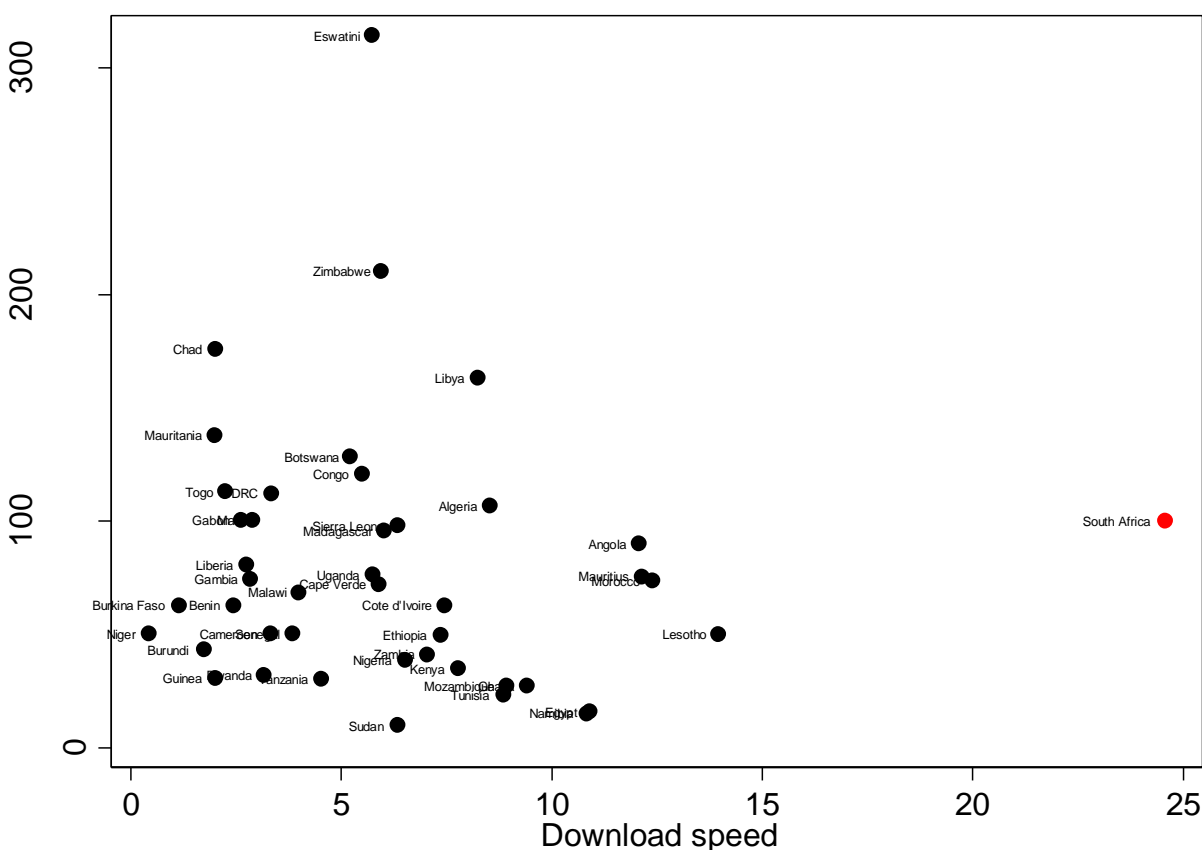
55. As noted above, prices are not the only measure of how well competition is functioning in a market and can be influenced by factors other than competition. Here the Authority has combined the pricing data above with measures of mobile data speeds and LTE coverage compiled by the GSMA for its Mobile Connectivity Index 2018, in order to give a quality-adjusted perspective on South Africa’s mobile data pricing. Download speeds are from Ookla while LTE coverage information was collected by the GSMA.

²⁴ Vodacom nonconfidential response to the Data Market Inquiry dated 14 June 2019, p.90-91.

²⁵ See A4I Methods and Sources at https://a4ai.org/extra/mobile_broadband_pricing_heat_map-2018Q4.

56. Figure 12 presents a scatterplot of prices (in Q1 2019) and download speeds (in 2017) for African countries. It highlights that while South Africa's prices are not the lowest, the download speeds experienced by South African customers are much faster than anywhere else in the continent, including large comparator countries like Egypt, Morocco, Ghana, Nigeria and Kenya.

**Figure 12: Price for a 1GB bundle (USD) (Q1 2019) vs download speed (2017):
Africa**



Source: Research ICT Africa (2019), available [here](#); Ookla speed data sourced from GSMA (2018), available [here](#)

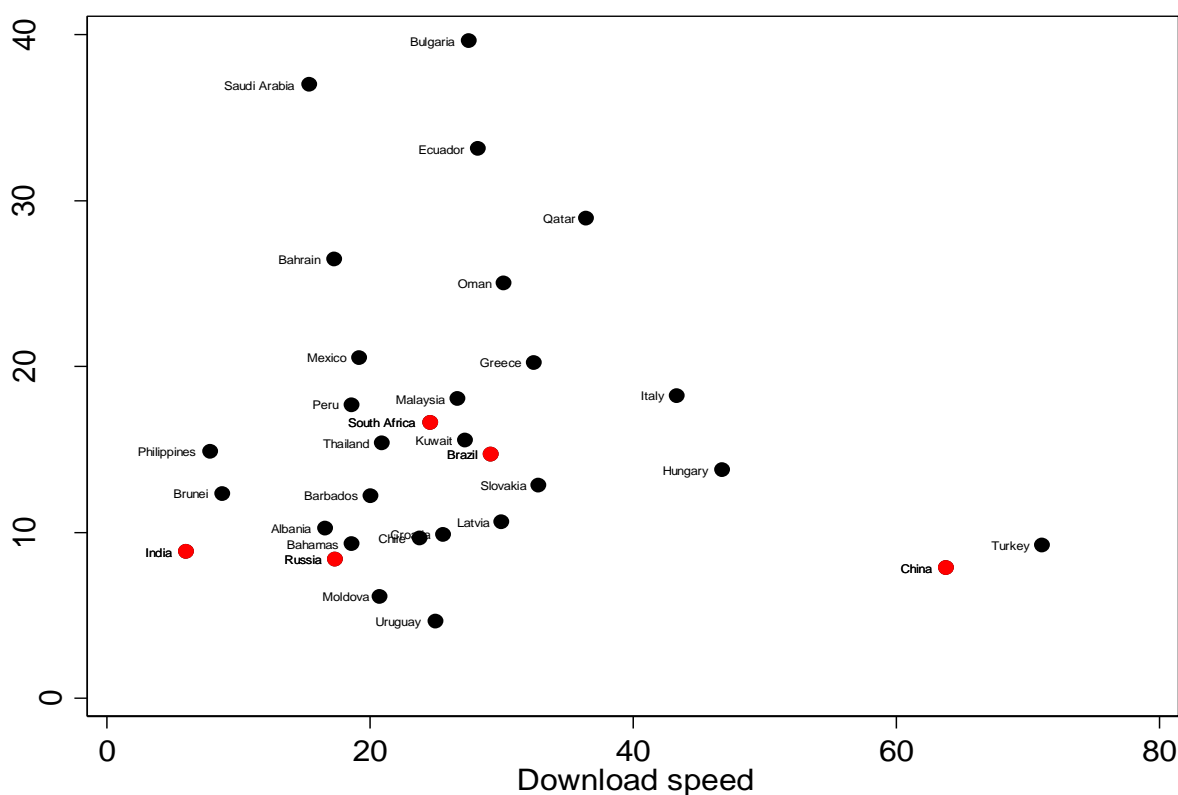
57. To add an additional dimension to the comparison, we have created a similar chart comparing South Africa to BRICS countries and countries classified by the ITU as

“Advanced” from a telecoms perspective.²⁶ These are more relevant comparator countries for South Africa from the perspective of income and level of development. Here we have used ITU pricing data and the same GSMA/Ookla data used above.

58. Figure 13 illustrates that while mobile data speeds in South Africa are extremely high by African standards (see figure 12), they are no better than average in the more advanced grouping.
59. Interestingly, while South African prices are higher than India and Russia’s, the speeds provided in South Africa are much higher. Put in an appropriate context, therefore, South Africa’s speed and quality performance looks neither excellent nor terrible. However, the examples of China and Turkey demonstrate that there is plenty of room for improvement.

²⁶ This is the second highest classification of the ITU after “Leader” which comprises mainly the most advanced economies such as the UK and the US.

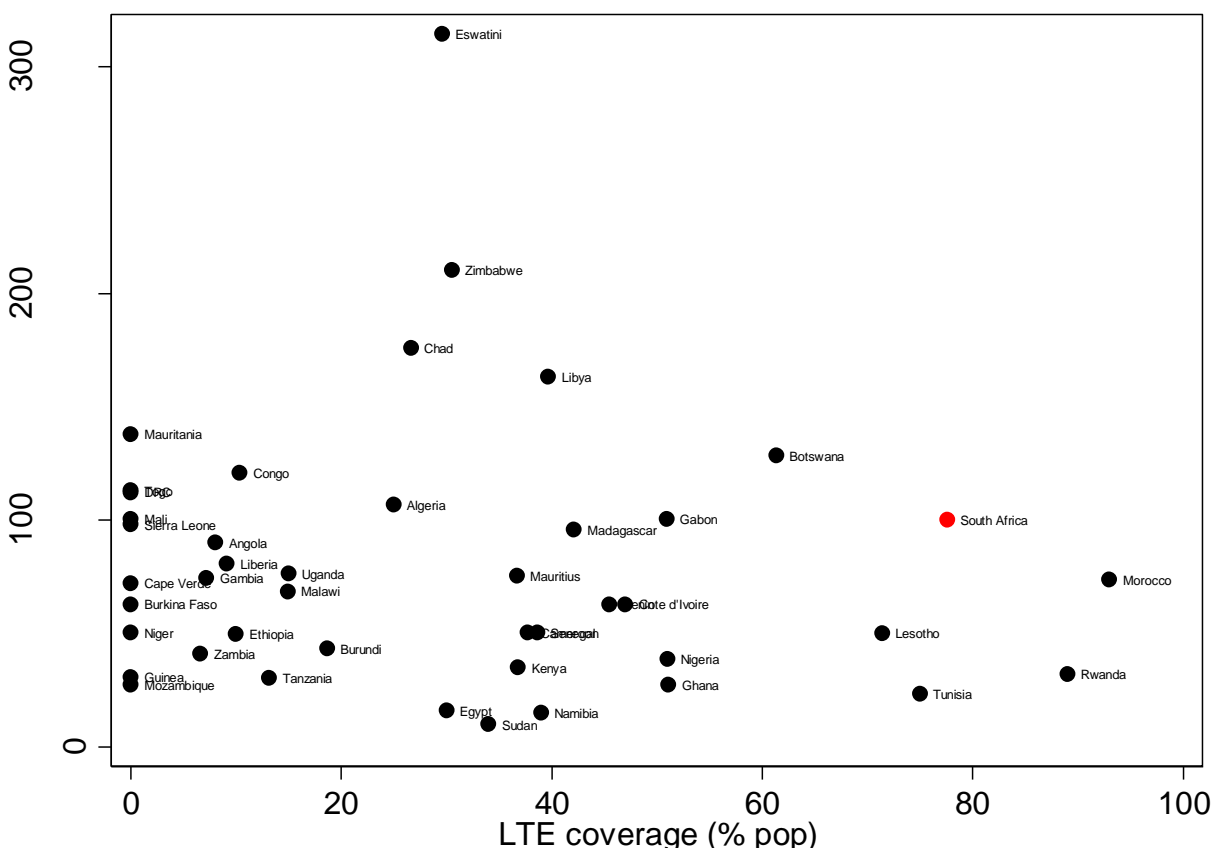
Figure 13: a 500MB bundle (USD PPP) (2016) vs download speed (2017): BRICS and ITU “Advanced” countries



Source: ITU (2017). Available [here](#); Ookla speed data sourced from GSMA (2018), available [here](#)

60. Figure 14 presents a scatterplot of prices and LTE coverage as a percentage of the population for African countries. Once again, this illustrates that while South Africa's prices are not the lowest, the proportion of the population with access to LTE (approaching 80%) is much higher than most other countries. Only Morocco, Tunisia, Lesotho and Rwanda have comparable levels of coverage, and the latter two are countries with a small area.

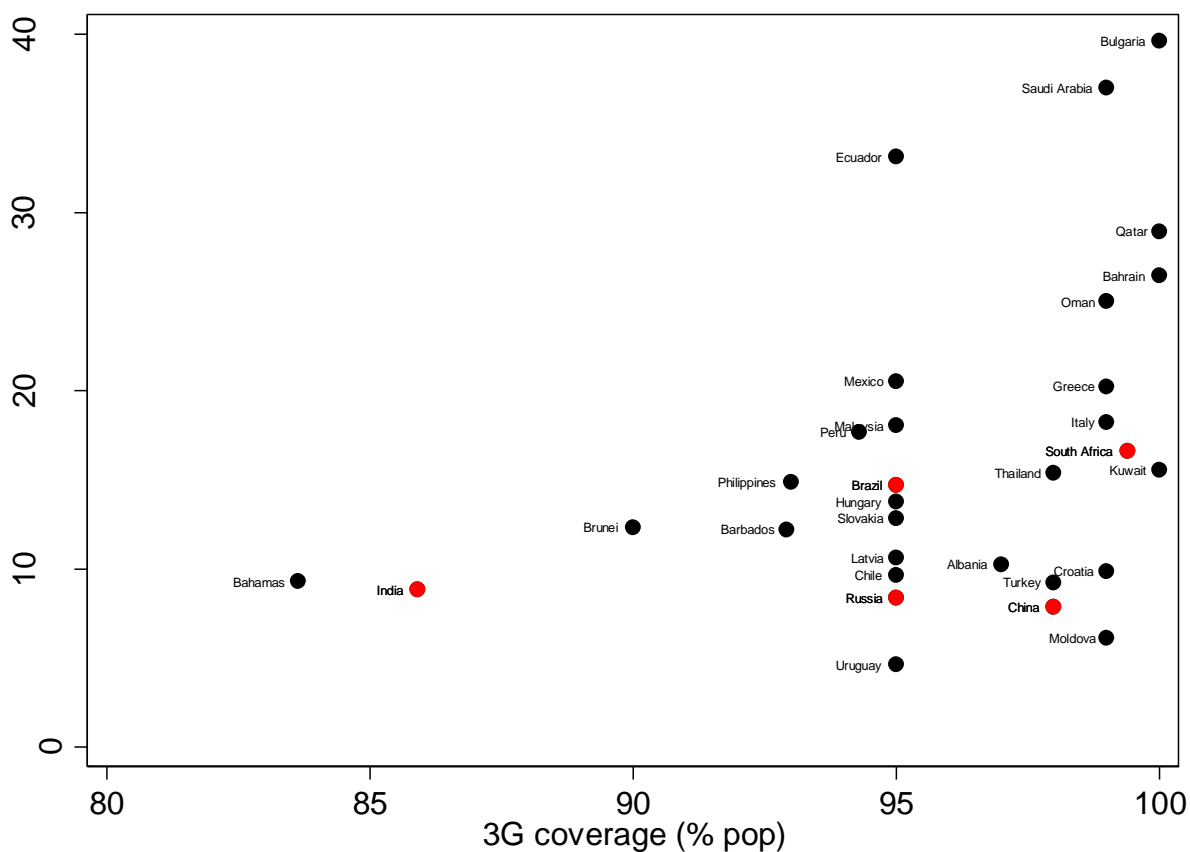
Figure 14: Price for a 1GB bundle (USD) (Q1 2019) vs LTE coverage (% of population) (2017): Africa



Source: Research ICT Africa (2019), available [here](#); coverage data from GSMA (2018), available [here](#).

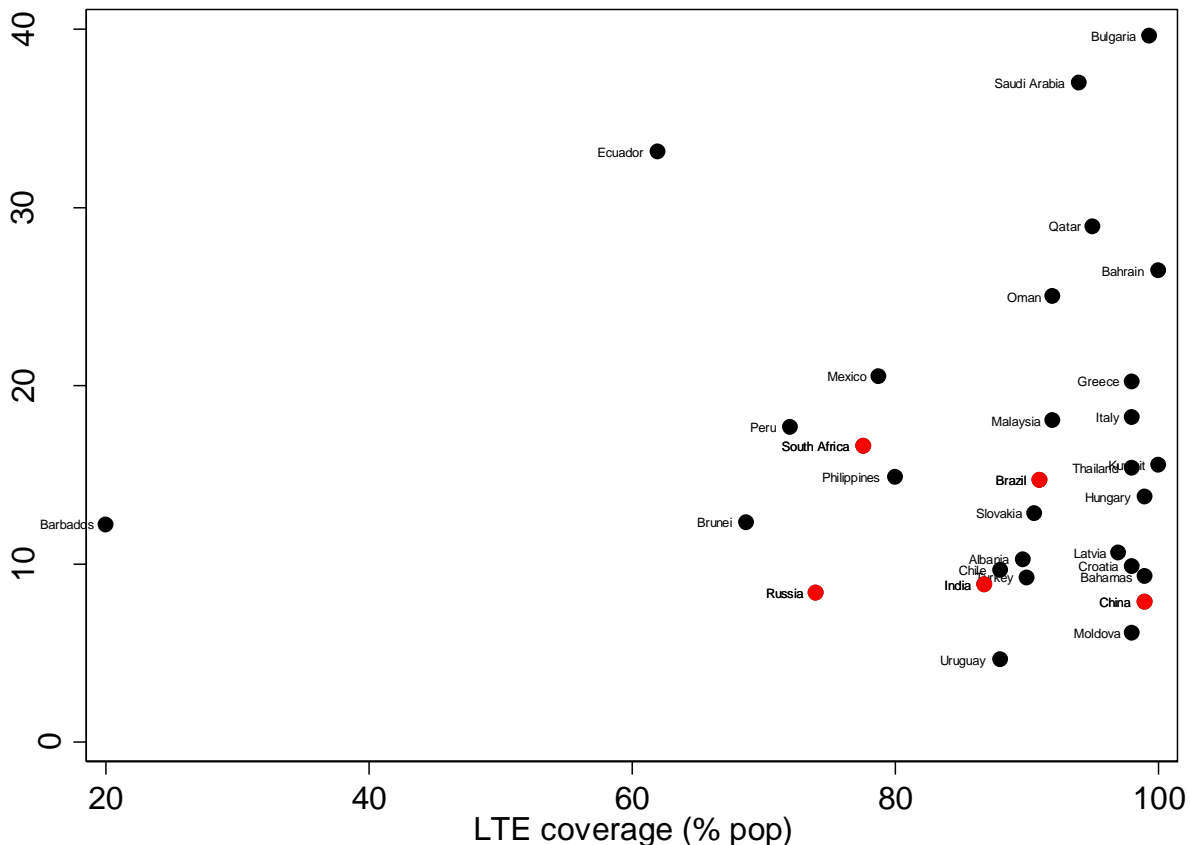
61. Figure 15 and Figure 16 once again compare South Africa to BRICS countries and the ITU’s “Advanced” group. In terms of 3G coverage, South Africa is among the top performers in the group. From an LTE perspective, South Africa fares less well in relation to the “Advanced” countries than it does relative to other African countries. Most of these countries have higher LTE coverage than South Africa of about 80% of the population. South Africa’s closest comparators are Mexico, Peru and the Philippines. India has slightly higher coverage than South Africa (but lower speeds), while Russia’s coverage is slightly lower. It seems therefore that South Africa needs to improve levels of LTE coverage to be on a par with its peers. This may be assisted by the assignment of more spectrum, as discussed further below.

Figure 15: a 500MB bundle (USD PPP) (2016) vs 3G coverage (% of population) (2017): BRICS and ITU “Advanced” countries



Source: ITU (2017). Available [here](#); coverage data from GSMA (2018), available [here](#)

Figure 16: a 500MB bundle (USD PPP) (2016) vs LTE coverage (% of population) (2017): BRICS and ITU “Advanced” countries



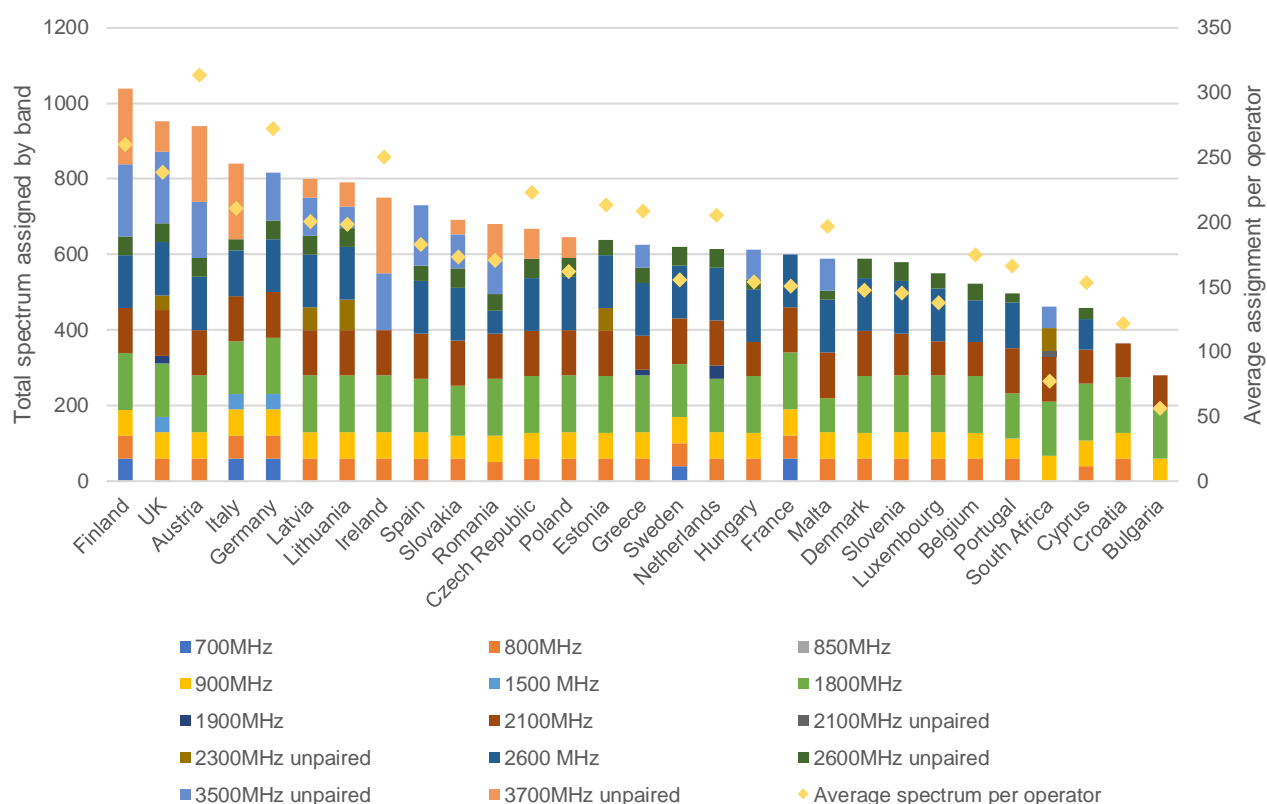
Source: ITU (2017). Available [here](#); coverage data from GSMA (2018), available [here](#)

62. A barrier to lower mobile data prices in South Africa which has frequently been cited is the lack of spectrum assigned to the mobile operators. This is since having access to spectrum lowers the cost to operators of rolling out both improved coverage and capacity, since it requires them to build fewer base stations. In addition, large amounts of spectrum are necessary to provide high speed mobile broadband, especially as the demand for data increases rapidly. If operators with inadequate spectrum assignments are struggling to meet data capacity requirements from their existing customers, this lowers their incentive to reduce prices as lower prices will lead to higher volumes which could result in declining network quality. There are

therefore a number of reasons why spectrum assignment is critical to achieving cheap, high quality mobile broadband.

63. South Africa has assigned relatively little spectrum for mobile use compared to international benchmarks. Figure 17 shows the spectrum assigned to mobile operators in EU countries and South Africa by frequency band, as well as the average spectrum assigned per operator. This illustrates that South Africa is well behind the leading countries when it comes to assigning spectrum for mobile broadband, having assigned about half the spectrum compared to the UK for example, and with an extremely low assignment per operator.

Figure 17: Assignment of mobile spectrum in Europe, 2019

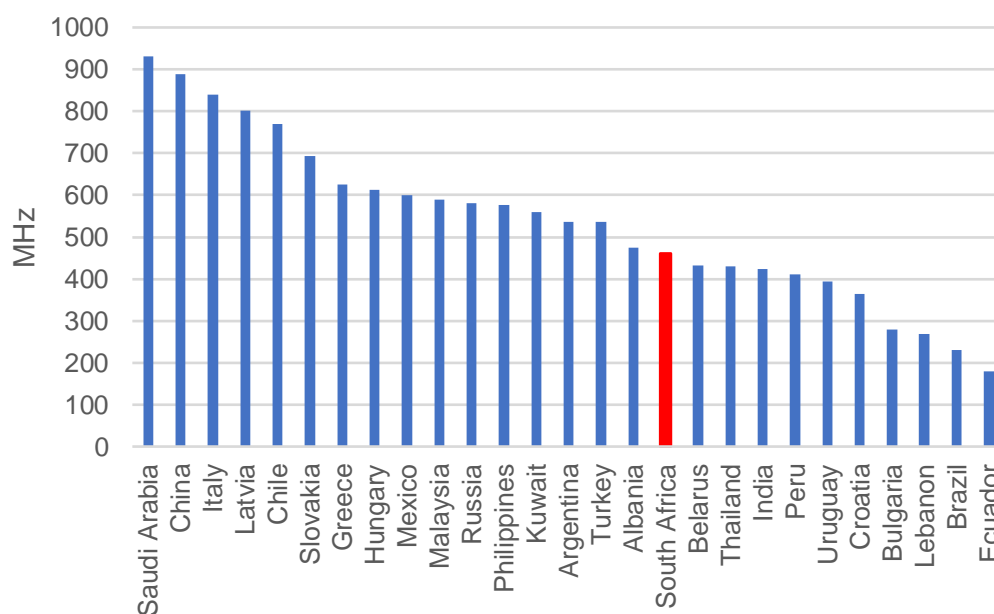


Source: <https://www.spectrummonitoring.com/> and regulator websites

64. Figure 18 illustrates the spectrum assignments of the BRICS countries and the countries classified as “Advanced” by the ITU. China’s much better performance in terms of speed and price is put in context when seen alongside the fact that it has

assigned nearly twice the spectrum that South Africa has. While these comparisons do not prove a causal link between spectrum assignments and prices, the graph below highlights a lack of additional spectrum in South Africa and that more spectrum needs to be assigned in order to enable licensees to deploy new technologies efficiently and increase network capacity.

Figure 18: Assignment of mobile spectrum in BRICS and ITU “Advanced” countries



Source: <https://www.spectrummonitoring.com/> and regulator websites

65. In order to further examine which factors influence mobile broadband prices, cross-sectional regression analysis was conducted using data on 24 countries²⁷ for which

²⁷ Algeria, Argentina, Australia, Brazil, Canada, Chile, France, Germany, Guatemala, India, Italy, Kenya, Malaysia, Mexico, New Zealand, Nigeria, Peru, Poland, Saudi Arabia, South Africa, Spain, Tanzania, Tunisia, UK, USA.

there was availability of good pricing data over four years²⁸ (from Tarifica) as well as data on spectrum assignments and a range of other variables listed in Table 1.²⁹

Table 1: Variables used in regression analysis

Variable	Description	Source
HHI	Herfindahl-Hirschmann index	ITU
Fixed-line penetration	Population with fixed-line telephone (%)	World Bank
GDP per capita PPP	GDP per capita in USD PPP (variable exchange rate)	World Bank
Density of population	Density of population (tsd/km2)	World Bank
Unemployment	Unemployment rate (%)	World Bank
Urban population	Share of urban population (%)	World Bank
Surface	Country surface (tsd km2)	World Bank
GINI	Gini index of income inequality	World Bank
MHz	Total spectrum assigned to mobile operators	Source: https://www.spectrummonitoring.com/ and regulator websites
Speed	Mobile download speeds	GSMA
LTE coverage	LTE coverage (% of population)	GSMA

66. The results of the regressions are shown in Table 2. From the different model specifications tested, some common themes emerge. Higher levels of fixed line penetration are significantly correlated with lower mobile data prices. This may be due to consumers having alternatives available or simply be a measure of the level of development of the market. GDP per capita has a small but significant positive correlation with prices indicating that mobile data prices are higher where customers are wealthier. Higher levels of spectrum assignment are also significantly correlated with lower prices, regardless of specification as illustrated in Figure 19. Finally, higher speeds are associated with lower prices which may be a result of higher

²⁸ 2014 to 2017.

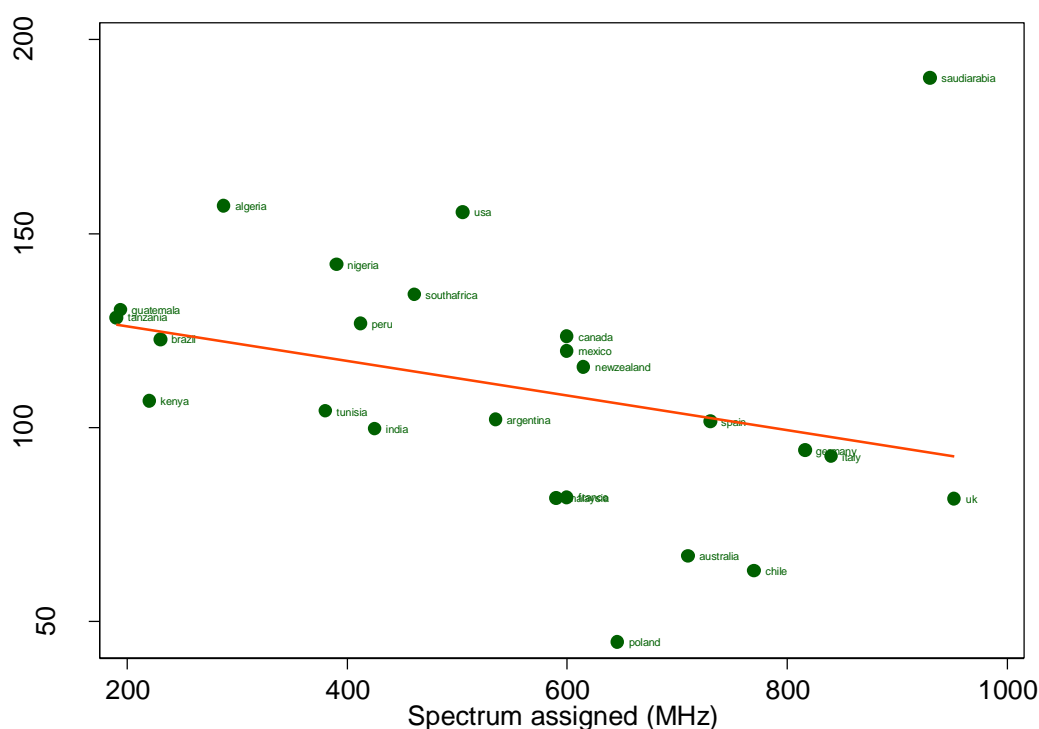
²⁹ A first stage hedonic price regression was estimated and then in the second stage the quality-adjusted prices obtained were regressed on the explanatory variables listed above.

volumes driving scale economies. There is therefore some support for the contention that spectrum assignment is associated with lower prices.

Table 2: Results of regression analysis

VARIABLES	Mod I	Mod II	Mod III
HHI	-27.973 (29.943)	20.980 (24.841)	7.164 (27.960)
Fixed-line penetration	-1.424*** (0.406)	-1.671*** (0.314)	-1.457*** (0.327)
GDP per capita PPP	0.003*** (0.000)	0.003*** (0.000)	0.003*** (0.000)
Density of population	-0.016 (0.034)		-0.039* (0.023)
Unemployment	0.487 (0.380)		
Urban population	0.315 (0.229)	0.366** (0.146)	
Time trend	-0.769 (2.469)	-2.161 (2.350)	-2.185 (2.408)
Surface	-0.001 (.001)		
GINI	0.424 (0.345)		
MHz	-0.084*** (0.022)	-0.096*** (0.015)	-0.084*** (0.016)
Speed	-0.670*** (0.196)	-0.629*** (0.185)	0.679*** (0.190)
LTE Coverage	-0.286** (0.140)	-0.186 (0.)	-0.156 (0.134)
Constant	103.030*** (22.080)	132.272*** (13.189)	156.873*** (12.712)
Observations	96	96	96
R-squared	0.689	0.667	0.654

Figure 19: Scatter plot of relative quality-adjusted prices and spectrum assignments (2017)



Source: Tarifica, Authority's own calculations, <https://www.spectrummonitoring.com/> and regulator websites

4.2.3.3 Conclusion from international comparisons

67. A nuanced picture emerges from the international comparisons the Authority has conducted. The analysis of mobile data prices has shown that South Africa's prices are neither extremely high nor very low in relation to other African countries or compared to countries which are more similar to South Africa in terms of their size and level of development. When put in further context with data on speeds and LTE coverage, it is clear that customers in South Africa are benefiting from a much higher quality of access than those in other African countries. With regard to the ITU's "Advanced" countries, South Africa performs reasonably well and its performance (in terms of price and quality) is similar to a number of countries that would be considered its peers (Brazil, Peru, Mexico, Thailand, Malaysia). However, this

analysis also indicates some degree of possible market failure given that some countries, notably China, out-perform South Africa on both price and quality.

68. The regression analysis provides support for the contention that lower levels of spectrum assignment are associated with higher prices. It is therefore imperative that spectrum be assigned to operators as soon as possible.

4.2.4 The role of voice services

69. Markets for mobile voice and data services are ineffectively competitive for the reasons described above. Nonetheless, it may be that one of the reasons for the ineffective competition is related to problems in markets for voice services, such as on-net prices that are similar to or lower than termination rates, generating 'tariff-mediated network effects'. This means that consumers prefer larger networks in general, and networks that their friends, family and work colleagues belong to, in order to benefit from on-net discounts.³⁰ There may also be significant switching costs where voice services are concerned, particularly if there are weaknesses in the ease of number porting. Tariff-mediated network effects and switching costs in turn can result in significant advantages to being a first-mover in markets for mobile services, since once a customer is won, the customer is reluctant to leave.
70. This suggests that voice services may play an important role in market outcomes where retail mobile services are concerned. Therefore, remedies affecting retail voice service, such as mobile termination rate regulation and number portability, are likely important interventions where markets for mobile services are concerned.

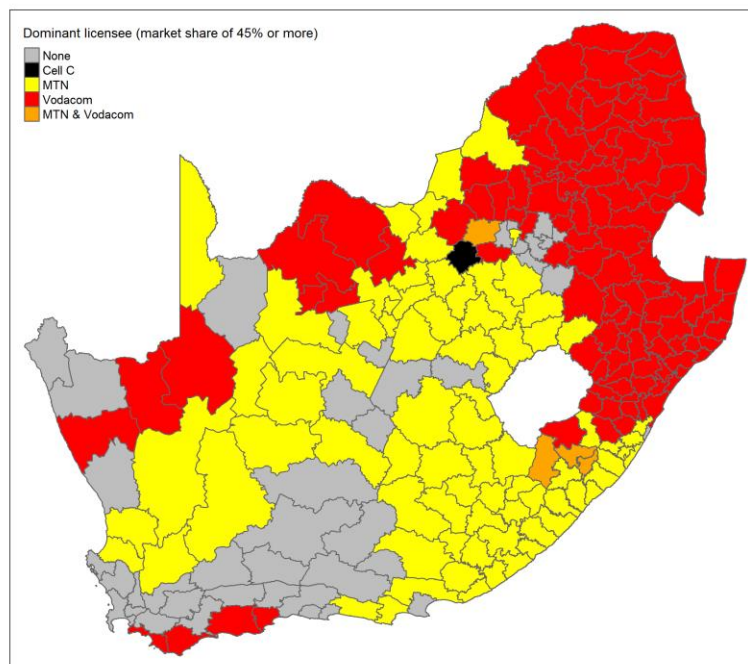
4.3 Significant market power

³⁰ In relation to household network effects in mobile telephony in South Africa, see: Grzybowski, L. (2015). The role of network effects and consumer heterogeneity in the adoption of mobile phones: Evidence from South Africa. *Telecommunications Policy*, 39(11), 933-943. On tariff-mediated network effects and the role of mobile termination rates in South Africa, see: Hawthorne, R. (2018). The effects of lower mobile termination rates in South Africa. *Telecommunications Policy*, 42(5), 374-385.

4.3.1 Market shares

71. A number of licensees have significant market power, measured using the dominance threshold (a 45% market share), in various municipalities. Vodacom is dominant in 110 municipalities, MTN is dominant in 78 municipalities and MTN and Vodacom both have a share of 45% or more in 4 municipalities (see Figure 20). Cell C has a market share of 45% in one local municipality, and 41 municipalities do not have a dominant operator.

Figure 20: Dominant licensee (market share of 45% or more, by local and metropolitan municipality)



4.3.2 Extent of vertical integration

72. MTN and Vodacom are both vertically integrated since they operate downstream in offering retail services as well as upstream, having been assigned spectrum, operating their own high sites and offering roaming services. This degree of vertical integration is likely harmful to competition and gives rise to both operators having significant market power at the wholesale and retail levels. Evidence that the extent

of vertical integration is harmful to competition is the limited sharing of infrastructure in South Africa and the very high costs of roaming (discussed below).

- 73.** In addition, there is a strong correlation between the level of concentration of ownership of mobile sites and retail customers in municipalities in South Africa (see

75. Figure 21).³¹ Similarly, site market shares and customer market shares are highly correlated (see Figure 22).³² This suggests that the level of competition at the retail level is strongly linked to the level of competition at the wholesale level. There is therefore likely a strong link between market power at the wholesale and retail levels. In fact, Vodacom and MTN's dominant positions in wholesale site access services are strongly correlated with their dominant positions at the retail level.³³ The extent of vertical integration between wholesale and retail therefore confers market power on MTN and Vodacom.
76. MTN and Vodacom therefore are vertically integrated in a manner that gives rise to competition concerns, and they accordingly have significant market power in terms of the ECA.

³¹ The correlation between site market concentration and customer market concentration (measured by the HHI) is 0.46, suggesting a strong link between wholesale and retail concentration.

³² The correlation between site market shares and customer market shares is 0.69, suggesting a strong positive link between wholesale and retail competition.

³³ The correlation coefficient between MTN's dominant position in markets for sites and customers is 0.4 while the correlation coefficient between Vodacom's dominant positions in markets for sites and customers is 0.68.

Figure 21: Relationship between concentration (HHI) at the wholesale (site) and retail (customer) levels, municipalities

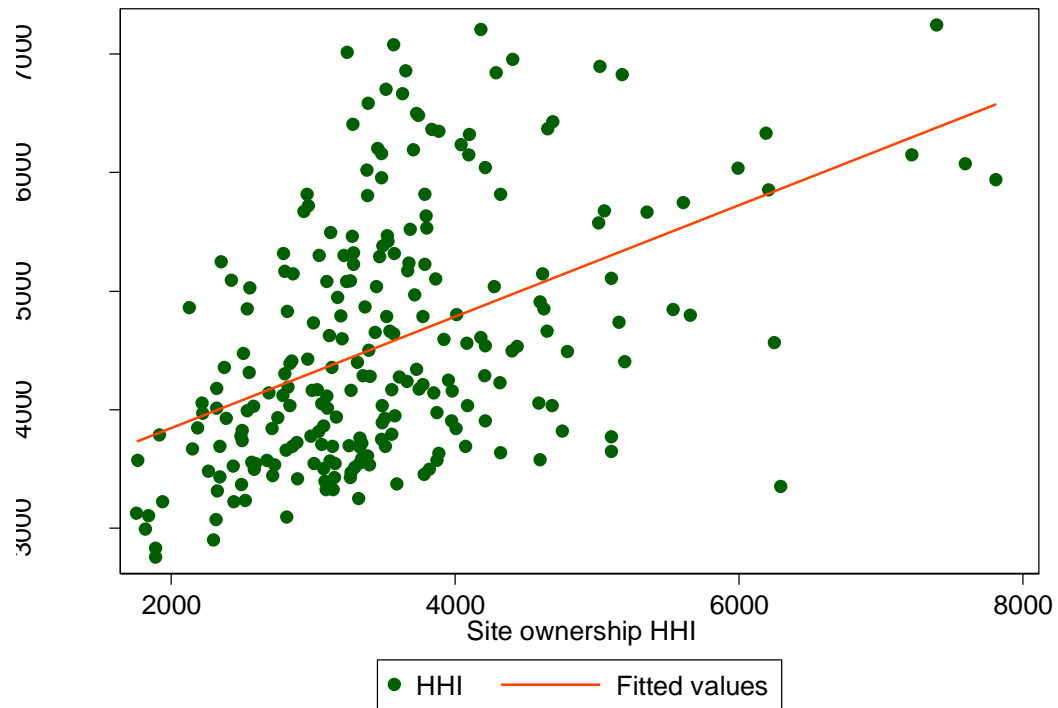
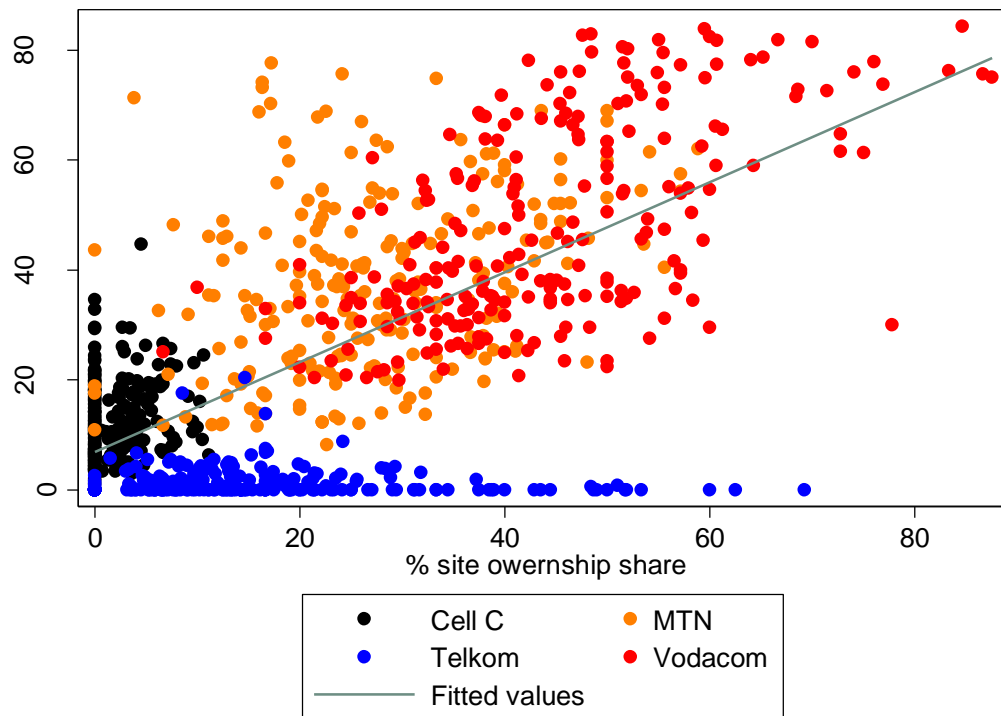


Figure 22: Relationship between wholesale (site) and retail (customer) market shares (at the operator and municipal level)



4.4 Pro-competitive licence conditions

77. In the Authority's Priority Markets study, it expressed a preference for regulating upstream markets:

*"A review of the retail market also provides scope for intervening at the retail level, if warranted. However, this does not necessarily imply that remedies would be imposed at that level. The Authority maintains that it would have a preference to regulate at the wholesale level."*³⁴

78. There is an important link between retail competition and competition upstream where mobile telecommunications services are concerned, since greater retail

³⁴ ICASA (2018). Priority Markets Findings document, p. 41.

competition is possible once any market failures upstream have been addressed. This means that any market power identified in retail markets is best addressed in upstream markets. The Authority considers upstream markets in the sections that follow.

Question 5: Do you agree with the Authority's preliminary view on retail mobile services market? Please provide reasons for your response.

5 Upstream market 1: Spectrum

5.1 Relevant markets

5.1.1 Product markets

79. Access spectrum is a required input into the provision of wholesale and retail mobile broadband services. There is no substitute for spectrum in terms of mobile network services. Different frequencies have different propagation characteristics such that spectrum in different bands may not be perfect substitutes for one another. The closer together two frequency bands are, the closer substitutes they are for one another from the perspective of providing mobile services. The Authority finds that the dynamics of competition across the various spectrum bands are similar and, therefore, it is not necessary to define narrower markets for the purposes of understanding competition.

5.1.2 Geographic markets

80. From a geographic perspective, spectrum has been assigned nationally in South Africa, and therefore competitive dynamics with respect to spectrum should be analysed nationally. Going forward the approach used to assign spectrum may change but not within the current review period.

5.2 Effectiveness of competition

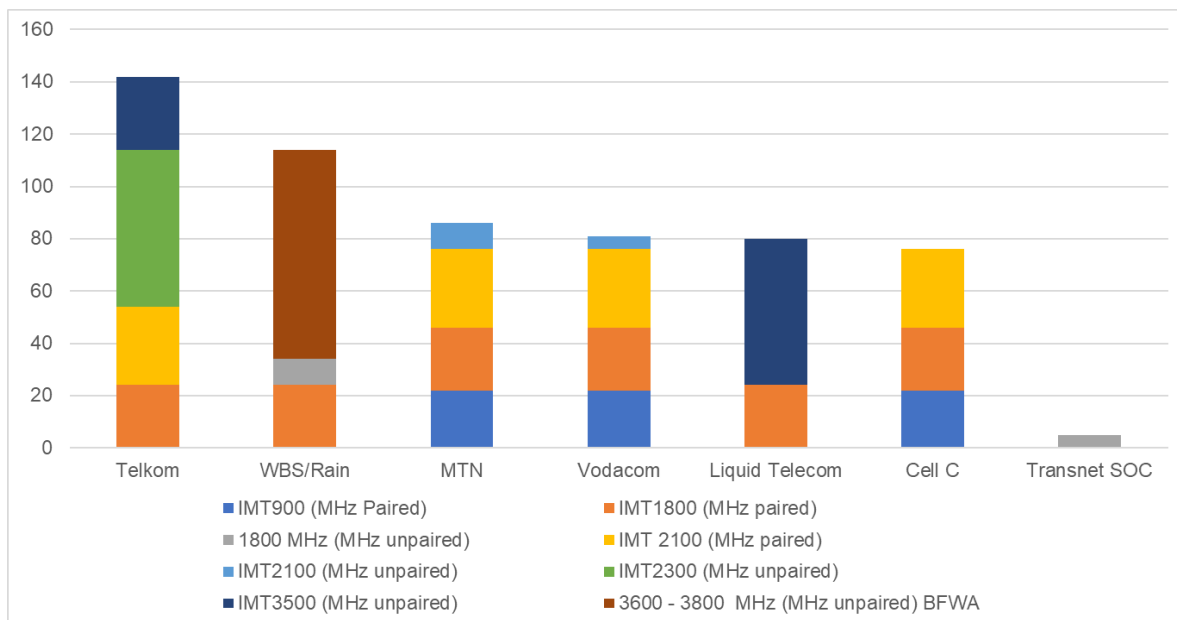
5.2.1 Barriers to entry

81. Barriers to entry in spectrum markets are determined by the spectrum assignment and licensing process. Assignment and licensing should be conducted in a pro-competitive manner which enables efficient new entry. This is discussed further below.

5.2.2 Market shares

82. Figure 23 and
83. Table 3 illustrate that MTN, Vodacom and Cell C have almost identical spectrum assignments (15%, 14% and 13% respectively). Telkom, Liquid Telecom and WBS/Rain have (24%, 14% and 20% respectively). However, Telkom, Liquid Telecom and WBS/Rain do not have sub-1GHz spectrum assignment.
84. Overall, this results in an HHI score for all bands of 1812. This is relatively concentrated, but less so than the retail mobile market.

Figure 23: Current assignment of mobile spectrum in South Africa



85. In a market with four operators, Ofcom considers an appropriate spectrum cap to be 37% of all spectrum and that an operator may be too small to be credible if it

holds less than 10% to 15% of available spectrum.³⁵ The largest spectrum market share in South Africa is held by Telkom, with 24% of the assigned spectrum currently. Transnet has the smallest assignment with only 1% of the spectrum.

Table 3: Current assignment of mobile spectrum and market shares in South Africa

Licensee	IMT900 (MHz Paired)	IMT1800 (MHz paired)	1800 MHz (MHz unpaired)	IMT 2100 (MHz paired)	IMT2100 (MHz unpaired)	IMT2300 (MHz unpaired)	IMT3500 (MHz unpaired)	3600 - 3800 MHz (MHz unpaired) BFWA	Total	Market share - all bands	Market share - below 1 GHz
Telkom		24		30		60	28		142	24%	
MTN	22	24		30	10				86	15%	33%
Vodacom	22	24		30	5				81	14%	33%
Cell C	22	24		30					76	13%	33%
Liquid Telecom*		24					56		80	14%	
WBS/Rain		24	10					80	114	20%	
Transnet SOC			5						5	1%	
TOTAL	66	144	15	120	15	60	84	80	584		

Source: ICASA Spectrum Assignment database.

*Liquid Telecom is in the process of migrating out of 800MHz.

86. Although Telkom has the most spectrum, it does not have sub-1GHz spectrum which it claims puts it at a competitive disadvantage relative to other operators.³⁶ However, it does have large assignments of 2300MHz (unpaired) and small assignment of 3500MHz (unpaired) which the other mobile operators do not have and which it is using for LTE (100% and 33%, respectively).³⁷
87. Ofcom states in its consultation document on the award of 700MHz and 3600 to 3800MHz spectrum bands that it is unlikely that any asymmetries in low frequency spectrum would result in a weakening of competition.³⁸ Its key concern was that all four UK operators remain credible following the auction with sufficient spectrum to

³⁵ Ofcom (2018). Award of the 700MHz and 3.6 to 3.8GHz spectrum bands. Available [here](#).

³⁶ Telkom submission to ICASA dated 11 March 2019, p. 15.

³⁷ Telkom submission to ICASA dated 11 March 2019, p. 13.

³⁸ Ofcom (2018). Award of the 700 MHz and 3.6 to 3.8 GHz spectrum bands. Available [here](#).

have a “route to 5G”. It considered the possibility that asymmetry of holdings of either mid frequency (1800MHz to 6 GHz) or low frequency spectrum could harm competition and found both to be unlikely. Ofcom notes that despite its low holdings of low frequency spectrum (2x5 MHz), EE performs better than O2 and Vodafone in terms of UK landmass and outdoor premises coverage. It notes that EE could have been disadvantaged in terms of providing high capacity services in deep indoor locations (a train station at rush hour for example) but concludes that this is only one aspect of quality of coverage and that there are alternative means that operators with small amounts of low frequency holdings could use to improve this aspect of coverage such as Wi-Fi, cellular repeaters, small cells, femtocells and network management technologies. It should be noted, however, that all operators in the UK had access to some sub-1 GHz spectrum (albeit a small amount) and that in an earlier 800MHz auction, Ofcom found it necessary to include a spectrum cap for sub-1 GHz spectrum as some MNOs did not have any such spectrum at the time of the auction.

88. In its report on the award of 700MHz and 3600MHz to 3800MHz spectrum, Ofcom highlights some additional competition concerns which can arise in spectrum markets:³⁹

- 88.1. Unmatchable competitive advantage – if one MNO has such a high relative share of spectrum that it can offer significantly superior services.
- 88.2. Spectrum hoarding – if spectrum is neutralized instead of being used productively by another operator to compete.
- 88.3. Excess spectrum capacity distorting the market – if it is used to threaten aggressive price cuts to prevent rivals from competing strongly.
- 88.4. Greater ability to launch new services without affecting existing services – if one operator has this ability and not its competitors.

³⁹ Ofcom (2018). Award of the 700MHz and 3.6 to 3.8 GHz spectrum bands. Available [here](#).

89. Neither an unmatched competitive advantage nor spectrum hoarding appears to be a feature of the market in South Africa currently. Future assignments will need to consider spectrum caps in order to ensure that this continues to be the case, and should ensure that a single operator does not have an advantage (i.e. to launch a new service) over the other competitors. There is also no evidence of excess spectrum capacity leading to market distortions at present, and all operators argue that more spectrum should be assigned in order to drive lower costs and greater scale economies in the industry.
90. With access to additional spectrum, Cell C points out that ICASA's bottom up (BU) call termination cost model showed that for a small operator with access to sub-1GHz spectrum, gaining access to additional spectrum would lead to a significant cost reduction which in turn lowers the cost of data. .
91. Both Vodacom and Cell C explain that additional spectrum assignments will lead to higher volumes of data usage which would lead to a further reduction in unit costs due to scale economies.⁴⁰ In addition, Vodacom argues that additional spectrum would stimulate price competition as *"Operators could as a result adopt a more aggressive pricing strategy, as they would not need to be as concerned as they currently are about network quality falling below an acceptable threshold in the event of network congestion."*⁴¹
92. Assigning more spectrum could also impact service quality.
93. As was discussed in section 4.2, South Africa has assigned much less spectrum for mobile broadband than many other countries and much more could feasibly be assigned. MTN, Vodacom and Cell C in particular have much lower assignments than mobile operators in most developed countries and also than those in countries classified as "Leading" or "Advanced" by the ITU. Given this, the main issue impacting competition from a spectrum perspective is that more spectrum needs to

⁴⁰ Vodacom submission to ICASA dated 11 March 2019 p.19; Cell C submission to ICASA dated 11 March 2019, p.8.

⁴¹ Vodacom submission to ICASA dated 11 March 2019, p.19.

be assigned for mobile spectrum in a pro-competitive manner. In terms of one operator having a greater ability to introduce new products and services without harming existing services, due to its beneficial spectrum assignment, Cell C has raised a concern that Vodacom is enjoying such an advantage due its site sharing and roaming agreement with Rain.⁴² The Authority's view is that Vodacom has not acquired Rain's spectrum, however, and is only able to make use of it through roaming on Rain's network, so it cannot be termed a spectrum assignment advantage as indicated by Cell C. The arrangement has also facilitated the expansion of Rain as a wholesale and retail competitor in mobile broadband, which is deemed to be pro-competitive.

5.3 Significant market power

5.3.1 Market shares

94. The Authority has not identified any operator with a market share of over 45% or with significant market power in the market for spectrum.

5.3.2 Extent of vertical integration

95. Participants in spectrum markets are usually vertically integrated as spectrum is an input into the provision of mobile network services. This can present a competition problem if spectrum is concentrated in the hands of one operator as discussed above. This is not presently the case in South Africa, but will be monitored by the Authority.

5.4 Pro-competitive licence conditions

96. While the Authority has not identified any operators with significant market power, how spectrum is assigned can have a major impact on competition in downstream markets. It can be a bottleneck and a barrier to entry if not assigned in a timely

⁴² Cell C submission to the Competition Commission Data Market Inquiry, p.40-42.

fashion. The Authority therefore considers it vital that spectrum is assigned as soon as possible in a pro-competitive manner.

Question 6: Do you agree with the Authority's preliminary view on spectrum market? Please provide reasons for your response.

6 Upstream market 2: Site access

6.1 Relevant markets

6.1.1 Priority markets study

97. With respect to wholesale markets, the Authority found in the priority markets Inquiry that wholesale mobile services should be prioritised and identified a broad market including facilities:

*"In line with the responses received, the Authority has identified a broad wholesale market for the supply of mobile network services and finds that facilities should also be included as part of the assessment in the context of a market review."*⁴³

98. In the following sections the Authority has considered narrower markets for the various components of wholesale mobile services including sites, discussed here.

6.1.2 Product markets

99. In this section, the Authority considered whether there is a separate market for site access. In order to provide network coverage in a given area, MNOs have a number of options:

⁴³ ICASA (2018). Priority Markets Findings document, p. 41.

- 99.1. Establish a new site either by renting space on a rooftop or acquiring access to land on which to construct a tower;
 - 99.2. Access existing sites through infrastructure sharing, including:
 - 99.2.1. Renting space on an existing tower;
 - 99.2.2. Entering into antenna or RAN sharing agreement with an operator which has coverage in the area;
 - 99.3. Enter into a roaming agreement with an operator which has coverage in the area.
100. First, it is necessary to consider whether establishing a new site of its own is likely to be a substitute for an MNO to accessing existing sites. There are considerable challenges to establishing new sites as the operators detailed in their responses to ICASA's questionnaires. In urban areas, possible sites are limited and often already occupied, making it difficult to roll out new sites. Telkom explained, for example that in urban areas *"in many instances, the most suitable site locations are already occupied by the incumbent providers"*.⁴⁴ In addition, regulatory processes and approvals such as processing of municipal leases, environmental impact assessments (EIAs) and wayleaves lead to substantial costs and delays. According to Telkom, there is a lack of cohesive policy by municipalities across different regions which means there is no standard approach to agreeing leases or interpreting policies and by-laws and no standard time taken to obtain approvals.⁴⁵
101. In addition to delays, establishing a new site is likely to be significantly more expensive than sharing an existing site in most cases since this enables the costs of establishing and maintaining the site to be borne by two (or more) operators instead of one. It is therefore unlikely that an operator would respond to a 5% to 10% increase in the price of site sharing by deciding to establish a new site of its own, particularly given the challenges and potential delays involved in doing so.

⁴⁴ Telkom submission to ICASA dated 24 May 2019, p.12.

⁴⁵ Telkom submission to ICASA dated 24 May 2019, p.18.

102. In a recent inquiry into mobile roaming, the ACCC found that infrastructure sharing is not a substitute for wholesale roaming services since even with infrastructure sharing, MNO's have to incur significant costs to build infrastructure in rural areas and this takes time.⁴⁶ Conversely, while roaming may be an alternative to infrastructure sharing in some cases, ultimately operators are likely to want to roll out their own infrastructure in most places in order to be able to control network quality and provide the best possible customer experience. Telkom explains that:

*"There is a trade-off between roaming charges and building/operating its own network, which is highly dependent on customer density in the relevant area. The relative costs of pursuing these initiatives versus a continuation of the current roaming arrangement would depend on the cost of that roaming arrangement, which is subject to periodic commercial negotiation. It would also depend on what choices Telkom Mobile would make in terms of additional self-supply – it may want to focus only on improving service quality and eliminating coverage gaps within its current coverage areas, or it may also want to expand its network coverage beyond those current coverage areas."*⁴⁷

103. This suggests that the relative price of roaming versus establishing sites is only one factor considered by operators and that other strategic factors and customer traffic play an important role in the decision of where to roam and where to roll out its own sites. Operators are likely to take a decision to build a network in a particular area and then look for opportunities to build or lease sites. The preliminary conclusion of the Authority, therefore, is that there is likely to be a market for access to sites which is distinct from the market for roaming.

6.1.3 Geographic markets

104. From a geographic perspective, there is evidence that competitive dynamics in relation to sites are at least sub-national and probably local in nature. As explained

⁴⁶ ACCC (2017). Domestic mobile roaming declaration inquiry: draft decision. Available [here](#).

⁴⁷ Telkom submission to ICASA dated 24 May 2019, p.18.

above, operators take decisions on where to roll out or augment network coverage and capacity based on the attractiveness of the customer base in different areas. This suggests that a site in one local area is unlikely to be seen as a substitute for a site in a different local area. In addition, many of the site sharing agreements provided to ICASA make a distinction in terms of rentals between metro and non-metro areas, with the rental charged for sites in metro areas being significantly higher than in non-metro areas. From a practical perspective, the coverage provided by a site, and therefore the extent of a local market, will vary depending on the type of terrain, height of the antenna and spectrum frequency applied at the site but is unlikely to be a radius of more than 30km.

105. The Authority does not take a firm view on exactly how localized the market for access to sites is but considers both national and sub-national markets that are at least as narrow as local and metropolitan municipalities for the purposes of analyzing market shares and market power below.

6.2 Effectiveness of competition

6.2.1 Barriers to entry

106. Municipal approvals are cited as a major delaying factor in rolling out sites, particularly in urban areas. In addition, it is alleged that the conduct of incumbent operators acts as a further barrier to entry.
107. Cell C points out that where an operator controls infrastructure in critical areas or areas where access to land is limited (such as high sites, shopping centre rooftops or stations), this provides it with market power and allows it to determine the price of access.⁴⁸
108. Smaller operators claim that the incumbents take a long time to consider and approve co-location requests. Both Cell C and Telkom explained that positioning on

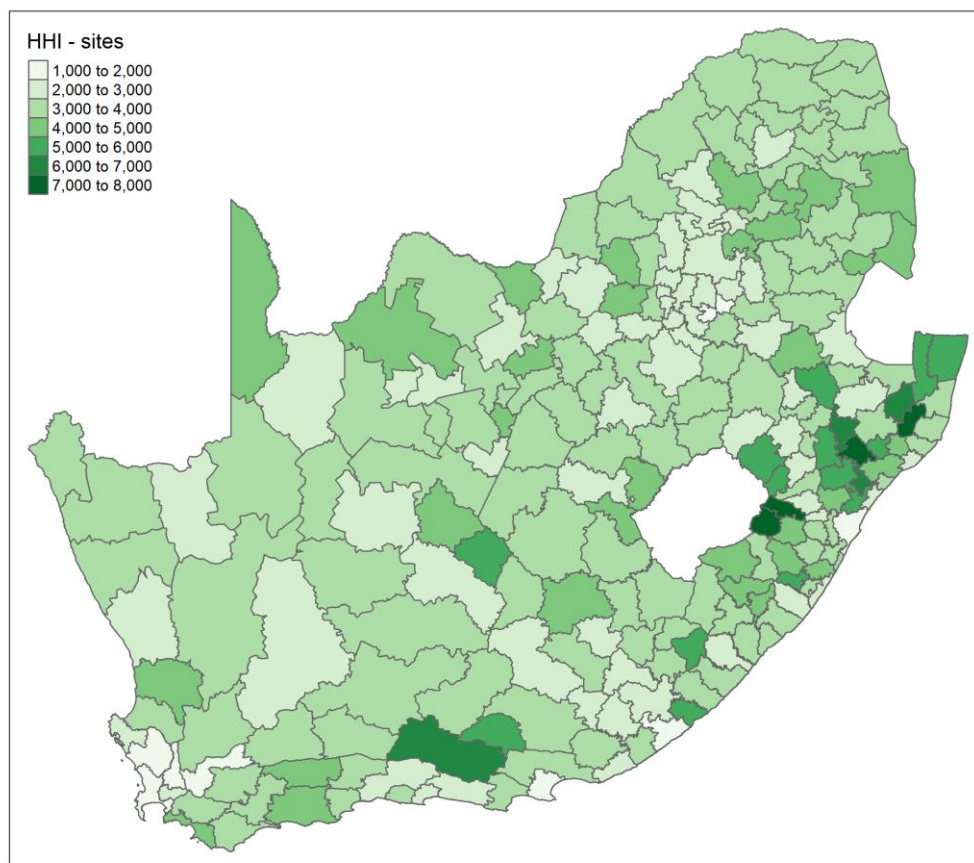
⁴⁸ Cell C submission to ICASA dated 11 March 2019, p.40.

the mast makes an important difference to the extent of coverage; the higher the position, the better the coverage. It has been claimed that the incumbent operators frequently grant space at a lower level than the access seeker would like, even where there is technically space available at a higher level. The need to reserve space for expansion by the site operator is often given as an explanation for this. By contrast, the tower companies typically allocate space on a first-come-first-served basis. However, Independent tower companies only account for around 14% of available sites.

6.2.2 Market shares

109. The market for site ownership is extremely concentrated, with MTN and Vodacom together accounting for just under 70% of the market and ATC and other tower companies accounting for a further 14%. Cell C and Telkom use relatively small numbers of Vodacom and MTN's sites.
110. The smaller operators are at an even bigger site disadvantage in non-metro areas.
111. When the owned sites are broken down into metro and non-metro areas, it is clear that non-metro areas are even more concentrated.
112. At the level of local municipalities, sites are even more concentrated. Markets are highly concentrated (have an HHI greater than 2000) in 226 out of 234 municipalities (see Figure 24).

Figure 24: HHI by local and metropolitan municipality for sites



Note: Sites operated by non-MNO third parties were not obtained directly but taken from MNO submissions.

Duplication across MNOs (where more than one MNO leases space on the same third party site) was eliminated using the latitudes and longitudes provided and an assumption that sites reported within 30m of one another are not unique sites but the same site which has been reported by two or more operators.

113. The lack of sites owned and shared by the smaller operators in non-metro areas is likely due to the fact that non-metro areas are less densely populated and therefore more marginal from an investment perspective for a smaller operator.

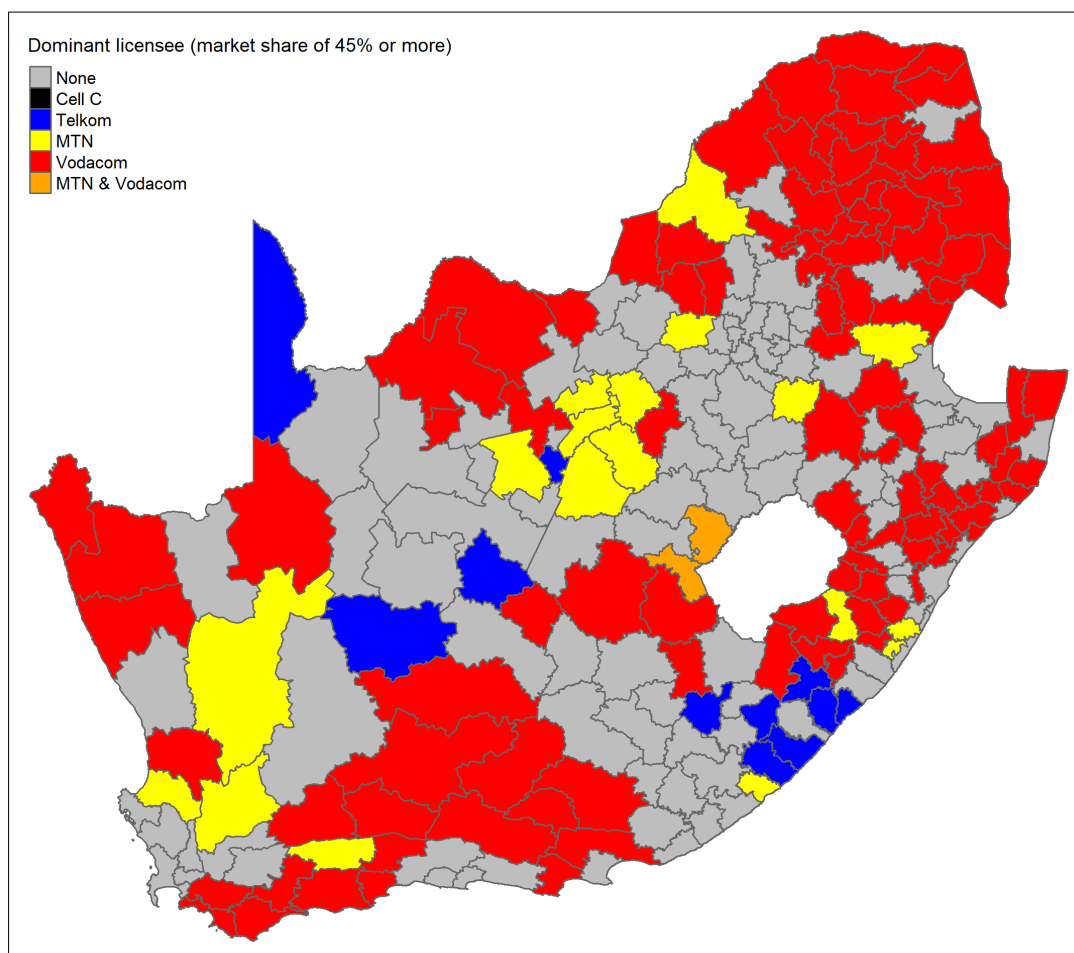
6.3 Significant market power

6.3.1 Market shares

114. Considering market shares at the local and metropolitan municipality level, Vodacom, MTN and Telkom are dominant in a number of municipalities (Figure 25).

Vodacom is dominant in 104 municipalities by itself, MTN is dominant in 18 by itself, and MTN and Vodacom are both dominant in 2 municipalities. Telkom is dominant in 11 municipalities, and in 99 municipalities no operator has a dominant share.

Figure 25: Dominance measured by site market shares in local and metropolitan municipalities



115. In terms of the ability to roll out new sites by sharing or establishing owned sites, Telkom has grown its site footprint rapidly in recent years. In contrast, Cell C has added only a small number of sites each year.
116. Telkom appears to be in an advantageous position in terms of rolling out new sites compared to other entrants as it has an extensive backhaul network spanning the whole country. However, given the structural separation of Telkom's wholesale and

retail businesses, Telkom Mobile argues that it receives no benefit from this and is treated like any other potential customer.

117. The market for site access is therefore highly concentrated, with one operator with significant market power in a large number of municipalities, particularly in non-metro areas. However, there are also signs that the market may be becoming more competitive and two major extensive site sharing agreements have been recently negotiated. In spite of these developments, it seems that there are still challenges for smaller operators in growing their site footprints. Telkom and other operators raise a number of concerns in terms of the barriers to rolling out new sites as was discussed in section 6.2.1.

6.3.2 Prices

118. Site rental charges reported by Telkom and Cell C illustrates that a standard site lease will include space on the mast (usually 3 m²) and space on the ground.
119. Vodacom and MTN receive significant advantage from owning large numbers of sites as it allows them to pair sites with one another, effectively securing them free site rental (although it should be noted that this advantage comes by virtue of their greater investment in sites). In addition, their reciprocal agreement for site rental includes favourable rental charges where sites are not paired. Cell C, MTN and Vodacom provided their costs of establishing a new site and the costs which would be shared by a site lessee. The major cost associated with a new site is the civil works, followed by the power connection and batteries required. MTN provided a range of costs for different types of sites so the average cost has been used.
120. MTN, Vodacom and Telkom provided an estimate of the monthly opex for different types of sites. This is much higher than the estimates given by the other operators, but it is unclear if this contains opex costs for non-shared elements such as antenna, radio equipment and backhaul. Telkom's estimate has therefore been disregarded for these purposes. The estimates from the other operators show that the monthly cost of operating a site, including rental for the land or space and maintenance of

the site, is between R6,000 and R12,000 depending on where the site is located . Urban sites are the most expensive to operate due to the high cost of land rental.

121. Using these estimates of capex and opex, we have calculated a range of total monthly costs which have been divided by two on the basis that two operators use the site (Table 4). This suggests a range of R12,000 per month to R23,000 per month depending on the type of site and where it is located.

Table 4: Range of possible total site costs based on available data

	Minimum	Maximum
Opex	6,000	12,000
Capex	18,000	35,000
Total cost	24,000	47,000
Cost per operator (2 operators)	12,000	23,000

Source: Cell C supplementary submission, Vodacom May submission, MTN May submission

122. A comparison of the costs suggested by our analysis with the prices charged by the operators for site rental show that in many cases the price charged for new rentals are not at a substantial premium to cost in 2018, although historically this may have been the case. It is also worth noting that in respect of granting access to existing sites, some of the investment costs will have already been recouped by the operator owning the site prior to the application to lease, and so capex costs may be lower than those we have used. Furthermore, some sites are shared with more than one operator which suggests that the cost per operator is lower. . The mobile operators do not seem to offer discounts for sites shared by more than one operator in their site sharing agreements.

6.3.3 Vertical integration

123. Vertical integration is an issue with respect to site access, as the majority of sites are owned by operators who also provide wholesale and retail mobile network services. In the retail discussion above, it was found that the high levels of concentration at the site level are correlated with high concentration at the retail level. There is a strong correlation between the level of concentration of mobile sites and retail customers in municipalities in South Africa (see

125. Figure 21) and site market shares and customer market shares are also highly correlated (see Figure 22). As noted above, there have also been complaints that larger operators use their control of site infrastructure to disadvantage smaller rivals.

6.4 Pro-competitive licence conditions

126. In the EU, a number of countries mandate that operators must publish infrastructure sharing opportunities either online, by notifying the regulator or through publishing on a third-party platform.⁴⁹ In other countries, while there is no regulated approach, information regarding cell location is available through privately organized databases or portals managed by the regulator.

127. In addition to sharing information, most European countries have a general passive infrastructure sharing obligation.⁵⁰ In France and the Netherlands, mobile operators are required to coordinate site planning. Some countries have also imposed requirements to share passive network elements through spectrum licensing conditions and many have issued guidelines for sharing.

128. A possible remedy to the observed impediments to competition in the site access market in South Africa is the re-drafting of facilities leasing regulations as contemplated by the ECA, together with more detailed guidelines. This would include a requirement to publish site information online, a time limit for the consideration of requests and rules around when site sharing should be considered technically and economically feasible. It would preclude the indefinite reserving of space on masts for the incumbent's equipment and facilitate the quicker roll out of new sites by smaller operators.

129. In addition accounting separation for the provision of sites would assist in providing transparency around site costs and the pricing of site leasing services and lessen

⁴⁹ See BEREC (2018). *BEREC report on infrastructure sharing*. Available [here](#). Belgium, Bulgaria, Croatia, Greece, Italy, Latvia, Liechtenstein, Montenegro and Serbia mandate the publishing of information by all operators, and Norway by any operator with SMP.

⁵⁰ BEREC (2018).

the opportunity for dominant operators to disadvantage smaller rivals through the provision of site leasing services.

Question 7: Do you agree with the Authority's preliminary view on site access market? Please provide reasons for your response.

7 Upstream market 3: Roaming

7.1 Overview

130. Roaming is a service that allows operators to use each others' networks in areas in which they have no or limited network coverage and/or capacity constraints in a particular geographic area.⁵¹ Depending on the licensing structure and operator needs, roaming can take different forms including international roaming (across countries), national roaming (within a country) and regional roaming (roaming across regions within a country, generally where there are regional licences). In this section we are concerned with national or in-country roaming. This allows an operator to offer a national offering even if they have not deployed infrastructure in all areas.
131. Roaming is offered in South Africa and in various other countries internationally as a commercially negotiated agreement. However, in particular jurisdictions it has explicitly been mandated, sometimes as part of a licence condition or spectrum assignment.⁵² In this section, first the benefits and costs of roaming are discussed, and market definition is then considered. This is followed by a description of national roaming agreements in South Africa and an assessment of the competitiveness of the market. Significant market power is then considered, followed by a discussion on remedies.

⁵¹ Source: GSMA and BEREC

⁵² This includes the New Zealand, Italy, Australia, Austria, Norway, the US and the UK (historically).

132. The benefits of national roaming are primarily facilitating market competitiveness and providing coverage in areas in which infrastructure investment is too costly or is not feasible. National roaming has primarily been mandated in three instances:

- 132.1. *Providing coverage in remote or rural areas:* In markets that are less mature, roaming, together with infrastructure sharing of sites can be used to increase and expand coverage. This is particularly true in markets with low population densities. Roaming can be a means of attaining coverage in remote areas where low volumes mean that it would take an extended period of time to recover investment in infrastructure. For example, in the UK, Ofcom had proposed “rural wholesale access” as a measure to enhance coverage by networks in rural areas to enhance coverage for the lagging operators.⁵³
- 132.2. *Assisting new entry:* In many instances roaming has been used to assist new entrants in the roll-out to ensure national coverage.
- 132.3. *Increasing coverage where regional licencing exists:* In countries with regional licences, roaming is a key step in offering a national service.⁵⁴

⁵³Ofcom, “Further options for improving mobile coverage: Advice to Government”, available at https://www.ofcom.org.uk/_data/assets/pdf_file/0017/120455/advice-government-improving-mobile-coverage.pdf. This has met with some criticism from operators and was ultimately not implemented. However, it was believed wholesale pricing that is sufficient to offset the investment risks could mitigate these risks.

⁵⁴ For example, in the US the FCC mandates data roaming by requiring providers offer data roaming arrangements on commercially reasonable terms and conditions subject to certain limitations. They are required to “negotiate commercially reasonable measures to safeguard against network congestion”. Under the data roaming rule, the Commission determines the commercial reasonableness of data roaming terms and conditions and resolves disputes thereunder on a case-by-case basis, taking into consideration the totality of circumstances of the individual negotiations. They concluded that the rule balances the incentives to invest in and deploy advanced networks and foster competition. See Federal Communication Commission, FCC 11-52, 7 April 2011, available at https://docs.fcc.gov/public/attachments/FCC-11-52A1_Rcd.pdf

133. Roaming can reduce prices. It was found that in the short-term roaming had an impact on cost saving and competition leading to a decrease in retail prices in countries such as Spain, Romania and Poland.⁵⁵
134. However, there are some drawbacks associated with roaming. This includes the potential for roaming to disincentivise infrastructure investment, and reduce the ability for companies to compete on differentiation in coverage.⁵⁶
135. What is common across many jurisdictions is that roaming is generally commercially negotiated and encouraged to improve coverage.⁵⁷

7.2 Roaming agreements in South Africa

136. In South Africa national roaming services have been entered into by various operators on the basis of commercial negotiations:
- 136.1. *Cell C-Vodacom*: Historically the first roaming arrangement was entered into when Cell C entered the market in 2001. At the time, Cell C needed national coverage while it built out its network. It was only able to enter into a roaming arrangement on 2G with Vodacom but the agreement has been adapted over time.
- 136.2. *Telkom-MTN*: On entry, Telkom entered into an agreement with MTN.
137. While these historic agreements were fairly stable over time, there have been numerous developments in the last year due to various agreements being signed.
- 137.1. Telkom agreement with Vodacom;

⁵⁵ BEREK Report on Infrastructure sharing, BoR (18) 116, 14 June 2018, p19

⁵⁶ For example, Ofcom pointed out the impact of roaming on investment incentives (such as decommissioning some masts and deterring the building or upgrading of masts).

⁵⁷ In Austria, Croatia, Denmark, France, Norway and Spain there is national roaming that is commercially driven. In Norway the dominant mobile operator is subject to infrastructure sharing obligations including national roaming as a merger remedy.

137.2. Cell C agreement with MTN; and

137.3. Vodacom roaming agreement with RAIN.

7.3 Market definition

7.3.1 Product market definition

138. In the Priority Markets Study, the upstream market for the wholesale provision of mobile RAN services was prioritised. While this includes the provision of national roaming services, the study did not formally define markets.
139. Wholesale mobile services include national roaming, MVNOs and APN services. In the past some licensees have argued that these three wholesale services comprise a single market as there may be some supply side substitutability.⁵⁸
140. However, this is not the case from a demand-side perspective and does not seem plausible in practice. At the very least, national roaming, MVNO and corporate APN services differ considerably from a demand side or access-seekers perspective and likely form different market segments. It can be noted that reseller APN and MVNO may have some overlap (discussed below in section 8). The markets are entirely different from an access-seeker's perspective and the provision of one is by no means a substitute for the other. A seeker of MVNO services generally focuses on billing and marketing and therefore would not switch to either national roaming or corporate APN access services in response to a SSNIP as they serve different functions and have different target markets. A company that requires roaming to fill coverage gaps would not switch to an APN service or an MVNO service in response to a price increase as it fulfills different objectives. Furthermore, while there may be some supply side substitutability, in practice while mobile operators in South Africa

⁵⁸ [CONFIDENTIAL TO VODACOM: See, for example, p32 of Vodacom's submission to the Priority Market study and p14 of Vodacom's submission to the Competition Commission Data Market Inquiry, 20 November 2017]

have offered APN access and often national roaming, most have not offered MVNO access, suggesting the supply dynamics differ.

141. As such the Authority considers national roaming and MVNO and APNs as a separate market.
142. Furthermore, as discussed previously, the market for wholesale roaming services is a separate market from other wholesale infrastructure services. While site access and infrastructure sharing can be a substitute in certain instances it is unlikely that in response to a SSNIP an operator would shift from roaming to infrastructure sharing. The two are complementary rather than substitutable services. Likewise, from an access seeker's perspective national roaming is different from MVNO/APN access.
143. This is supported by international precedent. Wholesale mobile roaming has been defined as a separate market in countries such as Australia and New Zealand.
144. The Australian Competition and Consumer Commission (ACCC) found that the wholesale mobile roaming market is a separate market based on the fact that there is no effective substitute services for wholesale roaming in regional Australia. In coming to this conclusion, it assessed various potential substitutes to roaming such as infrastructure sharing. However, it concluded that even with infrastructure sharing an MNO requires significant costs to deploy and operate infrastructure. In the Australian context this meant that for some MNOs the costs of the mobile network infrastructure was too high to justify investing in the area.
145. Similarly, New Zealand's Competition Commission has found that co-location does not provide a full substitute to national roaming.⁵⁹
146. In addition, there is likely to be some submarkets within the market for roaming. The ACCC, for example has noted that wholesale roaming services were not homogenous. Possible submarkets include

⁵⁹ Competition Commission of New Zealand, Review of National Roaming: Final decision on consideration of deregulation of national roaming, Decision No. [2018] NZCC 14, 4 September 2018.

- 146.1. roaming in metropolitan as opposed to rural or regional areas,
 - 146.2. separate markets in discrete geographic areas and
 - 146.3. markets based on type of network used (eg. 2G vs 3G).
147. As such the market for national roaming is a separate market to other upstream infrastructure services. The Authority considers that there may be submarkets by technology. For the purpose of this study, however, the Authority considers that while there are different technologies, they are likely to have similar dynamics and as such roaming on 2G, 3G and 4G networks is grouped together for the purposes of analysis.

7.3.2 Geographic market definition

148. In assessing the geographic market for national roaming the key question is whether the market is national or has a narrower geographic definition.
149. While international roaming is usually country-wide, in contrast, national roaming agreements are usually based on a set of sites or location codes specified on a far narrower geographical basis. This is since roaming services are generally supplementary to sites owned by the company contracting for roaming capacity. As such, there are strong arguments for a more localized market as opposed to a national market. In addition, in some contracts pricing differs, or there are exclusions, based on whether a site is urban, rural or metro reflecting different dynamics in each of those types of markets.
150. A counterargument that could be made is that agreements are negotiated on a national basis and generally provide for coverage on a national basis. The ACCC, for example, defined the market for roaming as national. However, it did highlight that there are geographic differences in competitive conditions and noted that the nature and competition of services in national roaming differs depending on the area in which it is offered, particularly remote and regional areas in which there are limited alternatives.

151. In the South African context, national roaming agreements are sought to provide coverage in specific areas in which seekers do not have coverage. This suggests that the market for roaming has differing competitive dynamics from a broad national market and that access can only be sought from companies with a footprint in those specific areas. As such, for a seeker of roaming, the available alternatives are limited to those companies that have infrastructure in areas in which they require coverage. This suggests a far more local dynamic. The fact that roaming in South Africa is generally specified at site-level and often excludes particular sites supports this.
152. Contracts in South Africa show that roaming is typically not engaged in for Metro areas (with an exception of Rain/Vodacom) and is at times differentiated by urban and rural sites by specification and even price. As such this would suggest that the market for roaming may be as narrow as each site. In what follows below, markets that are at least as narrow as the local and metropolitan municipal levels are considered.

7.4 Effectiveness of competition

153. There are indications that there has historically been a lack of effective competition in national roaming in South Africa. Submissions to ICASA have included some complaints over national roaming costs. This includes two key complaints.
- 153.1. Firstly, that prices are too high.
- 153.2. Secondly, that quality is often poor and that this has impacted on the growth of networks using roaming.
154. In this section competition in roaming is assessed by considering barriers to entry and expansion, pricing and quality considerations and forward looking dynamics.

7.4.1 Barriers to entry

155. The provision of national roaming depends on capacity. Entry into the market for the provision of national roaming, similar to the provision of retail services, depends on factors including investment and ownership of site infrastructure.

156. In rural and remote areas there are barriers to entry to the provision of roaming services. This is because lower population density and usage volumes means that the cost of infrastructure is spread over lower volumes. This makes infrastructure rollout infeasible in certain areas and makes contracting for some form of wholesale access a better alternative, particularly for later entrants with lower market shares. As such, markets for the provision of roaming services are not easily contestable due to structural barriers..
157. A second barrier to new entry lies in switching costs and the length of contractual agreements. From an access seeker perspective, switching roaming providers or contracting with multiple providers is possible and occurs. However, it is generally not cost free as many contracts have minimum spend amounts and are often negotiated over multi-year periods. As such, existing roaming contracts that specify a minimum volume or minimum spend may inhibit entry from other providers.
158. These structural entry barriers make the market more susceptible to ineffective competition.

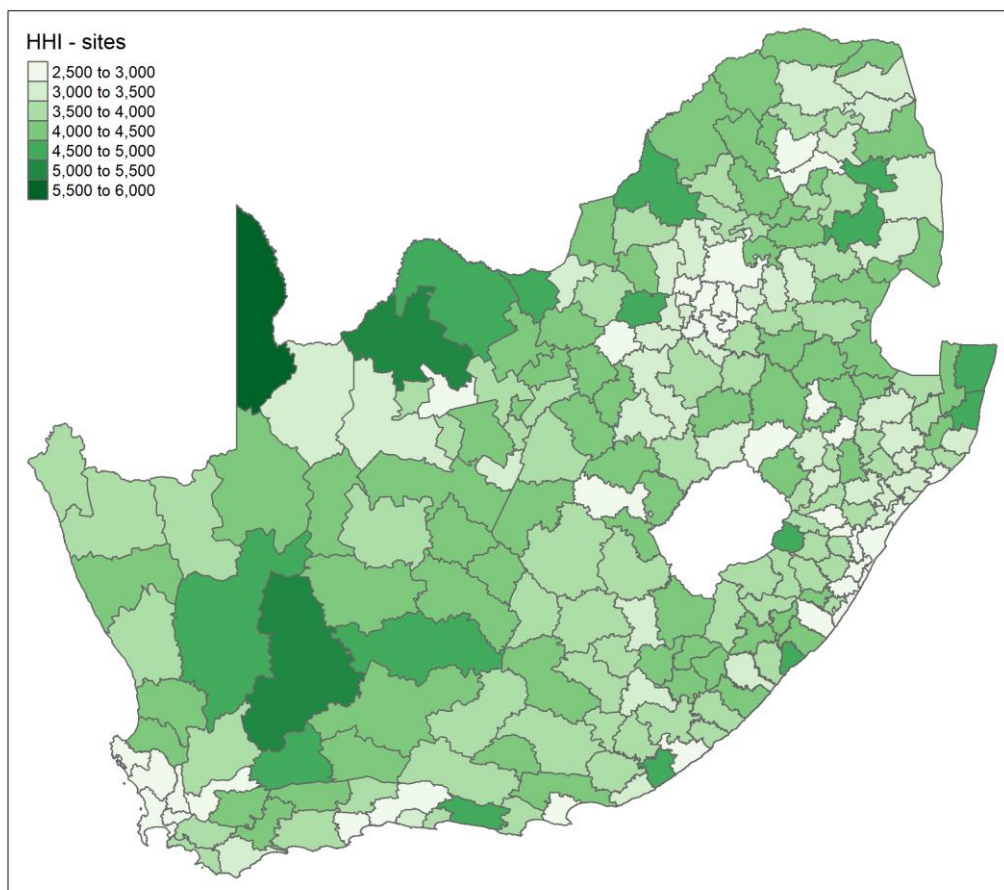
7.4.2 Market shares

159. As discussed above, the Authority considers markets for roaming that are at least as narrow as the local and metropolitan municipality level.
160. At present, sites in rural areas often only have coverage by MTN and Vodacom. As such, there is in effect a duopoly in the provision of roaming services in particular geographic locations.
161. Within roaming agreements, national roaming services are restricted or enabled by location area code.
162. Both Vodacom and MTN therefore have significant market power in specific geographic areas, since they each have a market share that exceeds 45%.
163. Network capacity depends on a range of factors including sites and traffic volumes. For the purposes of assessing capacity, particularly in remote and rural areas in which supplementary coverage is sought, a useful measure of the network capacity,

and thus capacity for roaming, is the number of sites within a municipality that a mobile network operator transmits services on. This is different to the number of sites that an MNO owns or operates, considered above in section 6. This is because roaming access seekers that are seeking roaming for the purposes of coverage, as opposed to additional capacity,

164. As is shown below, all 234 municipalities have an HHI above 2000, and are therefore highly concentrated (see Figure 26).

Figure 26: Network capacity HHI (measured by mobile network operator sites)



Note: All MTN, Vodacom, Cell C and Telkom Mobile sites (whether owned by the operator or not) represented here.

165. Furthermore, in addition to being dominant by virtue of the duopoly in national roaming, MTN and Vodacom are each dominant in the provision of roaming services in particular geographic locations in rural areas based on the location of their sites

and the resulting coverage. Vodacom and MTN have substantially greater coverage than Cell C and Telkom Mobile regardless of technology.

7.4.3 Prices and quality

166. There are contrasting perspectives on price competitiveness in the market for national roaming. High prices and ineffective competition in roaming has a direct effect on competitiveness in downstream retail. The submissions had several comments on price levels.
167. The Authority has considered the pricing of national roaming services in order to understand whether it is consistent with a competitive market. In many ways it is difficult to accurately assess roaming charges due to the structure of the contracts. Various agreements have floor charges or minimum fees which creates a level of variability in the per unit costs depending on the amount used. As such, lower volumes of usage make it more expensive. However, based on data provided by operators, the average costs of roaming per GB has been calculated . It is clear that year-on-year roaming prices have declined over the last three years as shown below.
168. With new agreements signed recently, prices are likely to fall even further.
169. However, there are indications that historical prices and current prices are high.
- 169.1. Compared to retail prices: Historic roaming prices are even higher. While there may be reasons for this (such as different costs of provision in these areas relative to the average), high prices are a signal of ineffective competition. For the smaller operators for whom volumes are insufficient for feasible infrastructure rollout, the fact that their average costs are potentially higher than the average price paid by consumers means that in order to compete they would have to make a loss. As such, it would likely not make sense for them to aggressively market in those areas. This is a potential explanation for the market share dynamics apparent in certain geographic regions.

- 169.2. Compared to modelled network costs: The roaming fee charged also appears to be significantly above the modelled network costs of a large operator. .
170. Quality is an important consideration in competing as is coverage. . A key complaint by roaming operators is that the quality provided while roaming is poor. In particular, historically seamless handover was not possible and calls were often dropped. This impacted on customers and decreased the competitiveness of companies that used roaming services.

7.4.4 Countervailing power

171. MTN and Vodacom, as providers argue that there is strong competition for national roaming. Reasons highlighted in the submissions include the following:
- 171.1. Access-seekers negotiate with both providers: Cell C and Telkom both negotiate with both large operators. For example, both MTN and Vodacom both bid for Telkom and Cell C business.
- 171.2. Switching is easy
- 171.3. Self-build is an option: Access seekers have the option of building their own infrastructure if prices were too high.
172. Vodacom has furthermore argued that national roaming in South Africa is competitive because: (i) number of national roaming providers is similar to or more than other countries, (ii) in other countries it is only regulated under specific circumstances such as a regional licensing regime or new operator.
173. However, contractual agreements often have minimum payment terms and as such while switching use of a particular site may not be costly, switching providers entirely during the duration of a contract has a clear cost.
174. As such while access seekers have some negotiating power this is limited by the high cost of self-build as an alternative, by contractual terms which lock them into contracts for periods of time and by the limited number of providers.

7.4.5 Forward looking assessment

175. It is important to note that the market for national roaming is fairly dynamic. In the last two years in particular a range of new agreements have been entered into. As discussed earlier, apart from historic agreements between Cell C and Vodacom and Telkom and MTN, these include the following new agreements:

175.1. Telkom agreement with Vodacom;

175.2. Cell C Agreement with MTN; and

175.3. Vodacom roaming agreement with RAIN.

176. Cell C ultimately signed an additional roaming deal with MTN, .

177. These agreements differ from those previously negotiated:

177.1. Wholesale roaming prices are lower and projected to fall further over time;

177.2. The technological solution agreed upon is often better (for example there is seamless handover); and

177.3. They enable better coverage.

178. As such, at this point in time there are a lot of changes in the roaming market both from a price, quality and coverage perspective. This is likely to filter through to the prices faced over time and the quality that companies are able to provide while roaming. As a result, there is the potential for companies that use roaming services to compete more effectively on price and to face less limitations in quality than in the past.

7.4.6 Conclusion

179. In an ideal scenario, roaming prices would be set at a level which enables entrants and smaller operators to utilise existing infrastructure until they have sufficient customers for own-build to be feasible. It may also be useful overall in allowing companies to make efficient use of infrastructure in remote areas where volumes are limited. There is therefore a tension between prices that are set at a level which

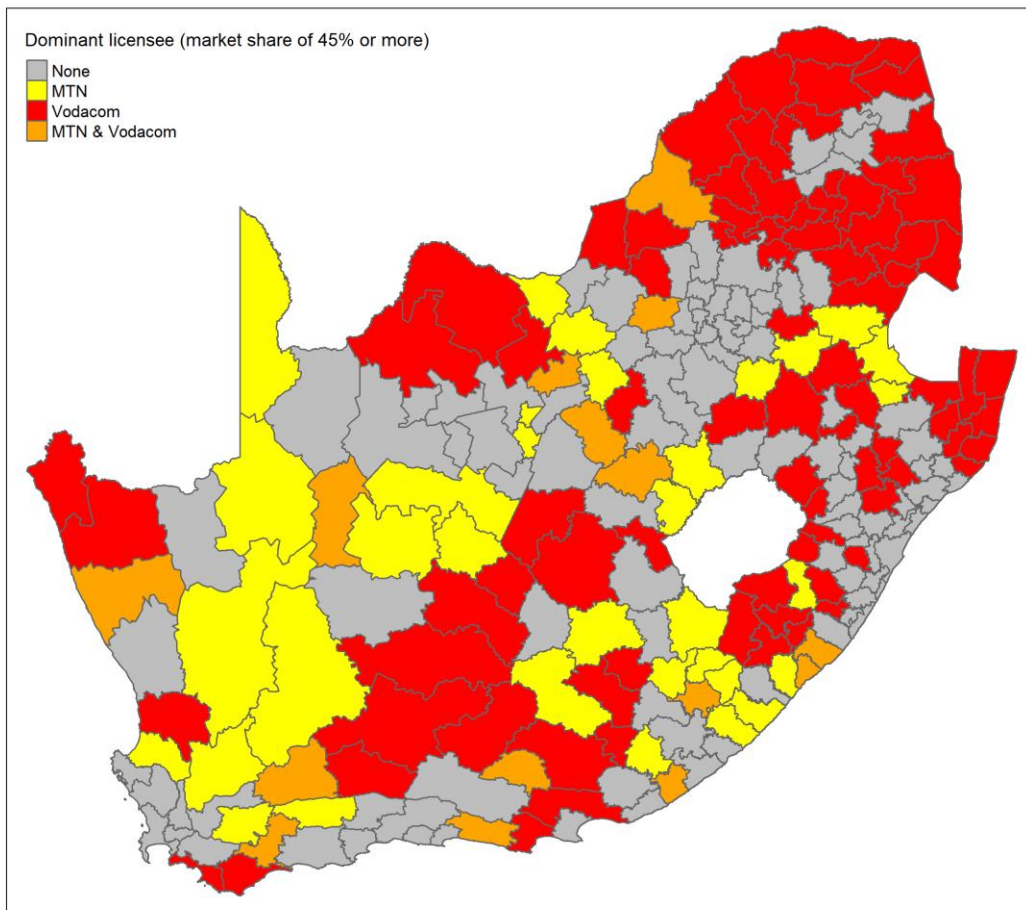
stifles competition in outlying and rural areas and incentivising own-build or site sharing to foster greater facilities-based competition.

180. At present it is clear that in particular geographic locations MTN and Vodacom have market power in the market for national roaming services. Furthermore, there is evidence that the market has characteristics which are indicative of a lack of competition. This includes the fact that prices have historically been at very high levels, and it appears that in some areas the average roaming cost is higher than the cost per MB that some retail customers are paying. Furthermore, quality has been poor which has impacted on the ability of roaming customers to expand their base to the point at which infrastructure build becomes feasible. It is therefore likely that the cost and quality of roaming has impacted on retail competition, particularly in rural and remote areas.
181. As such, intervention is warranted.
182. However, at present the market is changing and it is therefore difficult to provide forward looking regulation based on historic behaviour patterns without taking into account the fact that new contracts have been signed and there is a level of dynamism in the market.
183. Furthermore, there are also questions over the impact of regulating roaming on own build and facilities based competition. This suggests that while some intervention is required to counter the levels of ineffective competition, it should be careful and considered.

7.5 Significant market power

184. As discussed earlier, both Vodacom and MTN have significant market power in the market for roaming in particular geographic areas since they each have market shares exceeding 45%. From a network capacity perspective, measured by number of network sites, MTN is dominant (has a market share of 45% or more) in 34 local and metropolitan municipalities, Vodacom is dominant in 86 and MTN and Vodacom both have a market share exceeding 45% in 15 municipalities (see Figure 27). No operator has a dominant market share in 99 municipalities.

Figure 27: Licensees with significant market power (network capacity, measured by number of sites)



185. In addition, Vodacom and MTN are vertically integrated and operate at both the wholesale and retail levels in this sector. They both provide inputs on the wholesale level, namely national roaming, and compete on the retail level. As such, by maintaining high roaming prices they are able to ensure that retail competitors have higher costs, softening competition in the retail market into which they are vertically integrated. The extent of vertical integration therefore confers market power on MTN and Vodacom.

7.6 Pro-competitive licence conditions

186. Roaming is likely to continue be a key feature of the South African landscape given the size of the market and low volumes in particular areas. As such, potential remedies to ineffective competition and market power may include regulations that make it mandatory to offer a roaming agreement in areas in which there is market power. However, at this stage it is important to note that the market is currently evolving and in which there is a level of contestation among national roaming providers. Nonetheless, there are indications that there is ineffective competition.
187. In consideration of the changing market climate it would be hasty to implement strong remedies on pricing as there appears to be some level of contest among national roaming providers and prices are already on a downward trajectory. However, the level of market power and strong concerns that roaming prices, for certain periods in time and certain areas, were at levels that could have implied margin squeeze require that there is some intervention.
188. In the interests of improving the levels of competition while allowing the market space for development, the following remedies are recommended for the roaming market:
- 188.1. Mandating a roaming offer for parties dominant in particular geographic areas.
 - 188.2. Regulations to facilitate roaming. These would include agreement principles, timeframes and procedures to be followed and service parameters. It will also include dispute resolution mechanisms.
 - 188.3. Accounting separation: At this stage the market is changing and as such price regulation may be premature. However, in order to enhance transparency and ability for the regulator to monitor, functional accounting separation should be implemented. This is to split out all network related inputs needed to provide roaming as though the dominant operator used roaming as an input when providing its own retail services.

Question 8: Do you agree with the Authority's preliminary view on roaming market? Please provide reasons for your response.

8 Upstream market 4: MVNO and APN services

8.1 Context

189. The market for the wholesale supply of MVNO and APN services is provided through the bulk purchase or reselling of minutes or data. Suppliers of these services have the potential to play an important role in enhancing customer choice and alternatives at the retail level, and reducing cost.
190. Internationally, various authorities have promoted the growth of MVNOs by applying conditions related to MVNOs on mergers (for example, the merger between O2 and Three in Ireland⁶⁰, and between E-Plus and Telefonica in Germany⁶¹).
191. Currently in South Africa there are a range of MVNOs hosted by Cell C, namely FNB, Virgin Mobile, The Unlimited, Advinne, Sakeng, Frei One Digital.
192. In addition, wholesale APN services are provided by Vodacom, MTN and Telkom. These include wholesale offerings to licensees that in many ways play a similar role to that of an MVNO offering.
193. While MVNOs and resellers have the potential to enhance competition, at present there are indications that they are not providing the competitive constraint that they could:

- 193.1. There are concerns that while all MNOs have the capacity to offer wholesale services that would enable stronger retail competition, there seems to be a lack of provision.
- 193.2. Some wholesale APN resellers have indicated that prices charged by wholesale APN providers are high and there are no alternatives. .
194. The Authority does not definitely conclude on relevant markets, the effectiveness of competition, significant market power or pro-competitive licence conditions in respect of wholesale MVNO and APN services. This is because the effectiveness of competition in this wholesale market is likely linked to ineffective competition upstream in site access (upstream market 2) and roaming (upstream market 3), and so any competition concerns at the level of wholesale MVNO and APN services will likely be remedied upstream. Nonetheless, there are competition concerns in this segment of the value chain chain which the Authority considers in this section.

8.2 Market definition

195. As discussed previously, the market for the provision of MVNO services and wholesale APN services may be part of the same market but are separate from that of national roaming. Corporate APN services serve a different function from MVNO and wholesale APN services as they are focused on individual businesses who use it for their own servicing as opposed to reselling to retail customers. However, wholesale APN and MVNO services may have an element of substitutability from the demand side.
196. There are different ways of defining MVNO and reseller services given the range of ways in which these services can be provided and this may differ in the extent to which services are branded. From a demand-side perspective, an MVNO access seeker can create an offering using reseller offers, including via APN access. As such, MVNO and wholesale APNs can be considered together.
197. From a geographic perspective the market for MVNO and APN services are likely national as services are provided on a national basis.

8.3 Effectiveness of competition

198. The Authority is of the view that all four mobile operators have the capacity to supply wholesale APN and MVNO services. At present, Cell C is the only MNO to provide wholesale MVNO arrangements. However, this does not necessarily mean that Cell C has significant market power since all other operators have the ability to provide MVNO access. It would be incorrect to assess a market for provision based on current market shares where there is what is in effect a refusal to supply or a constructive refusal to supply. In addition, Cell C's MVNO offering may be constrained by wholesale APN alternatives.
199. Furthermore, there have been allegations that the market for wholesale APN services is currently uncompetitive. MTN, Vodacom, Telkom and Cell C all offer limited APN services, including some reseller APN offerings. Some of these share some similarities with MVNO services.
200. The lack of supply of MVNO services by all of the MNOs, and complaints about high wholesale APN prices relative to retail prices, suggest that this market is ineffectively competitive. This is particularly true when refusal to enter at the wholesale level protects companies from competition on the retail level. Well-priced wholesale offers would introduce greater competition and threaten market power in the retail market. As such, incentives in this market are linked to dominance in the retail market.
201. There are therefore indications that there is ineffective competition in the supply of wholesale APN and MVNO services. The Authority does not definitively conclude on this since any competition concerns at this level of the value chain likely derive from market power upstream in respect of site access and roaming, and can therefore be remedied at those levels.

8.4 Significant market power

202. The Authority is concerned about the ineffective competition in markets for APN/MVNO services but does not make a finding in respect of market power in this market. Any market power in the provision of MVNO and APN services is a result of market power at the sites and roaming levels and is likely linked to dominance in

retail markets, which have been discussed above in sections 5.3, 6.3 and 4.3 respectively. Remedies imposed in those markets are likely to mitigate any market power for APN/MVNO services and there is therefore no need to conclude on market power in respect of APN/MVNO services.

8.5 Pro-competitive licence conditions

203. The Authority considers that the remedies in markets for site access (section 6.4) and roaming services (section 0) are likely to improve competition in markets for MVNO/APN services. The Authority will monitor progress in the supply of MVNO/APN services while these remedies are in force and reassess whether further intervention is needed if the upstream remedies are not effective.

Question 9: Do you agree with the Authority's preliminary view on MVNO and APN services market? Please provide reasons for your response.

9 Conclusion

204. A brief overview of the Authority's preliminary findings in respect of each market is provided below:

204.1. Retail market: The Authority considers a retail product market for mobile services. While there may be separate markets for voice, SMS and data services, it is likely that the competitive dynamics are similar across these markets, and they can therefore be aggregated for analysis. The Authority considers retail geographic markets for mobile services that are at least as narrow as the local and metropolitan municipality level. This is based on (i) the fact that consumers can only use services that are available to them in the area in which they use the mobile service and on (ii) evidence that competitive dynamics vary considerably at the local level. There is market share and retail price evidence that suggests that these markets are ineffectively competitive in many cases. Vodacom is dominant in 110 municipalities, MTN is dominant in 78 municipalities and MTN and Vodacom both have a share of 45% or more in 4 municipalities. Cell C has a market share of 45% in one local municipality, and 41 municipalities do not have a dominant operator. The Authority considers that entry barriers into retail markets are considerable since wholesale services are not supplied competitively. This is so in respect of facilities-based entry and services based entry. The market for site access in particular is highly concentrated in many municipalities (discussed below), and full-coverage roaming services are only offered by two operators. The Authority considers that remedies in respect of these wholesale markets are appropriate to resolve ineffectively competitive markets at the retail level.

- 204.2. Upstream market 1, spectrum: The Authority considers a national market for spectrum, an important input for the supply of mobile services. While the supply of spectrum is limited, there are no licensees that have substantially greater holdings than other licensees, and there are no licensees that have significant market power in this market. In addition, the Authority plans to assign additional spectrum by the end of 2020. There is therefore no need to impose pro-competitive licence conditions in this market.
- 204.3. Upstream market 2, site access: the Authority considers a market for site access that is at least as narrow as local and metropolitan municipalities. This market is ineffectively competitive, with very high levels of concentration in 226 out of 234 municipalities, where the Herfindahl Hirschman Index ('HHI') is above 2000. Vodacom is dominant in 104 municipalities by itself, MTN is dominant in 18 by itself, and MTN and Vodacom are both dominant in 2 municipalities. Telkom is dominant in 11 municipalities, and in 99 municipalities no operator has a dominant share. A possible remedy to the observed impediments to competition in the site access market in South Africa is the re-drafting of facilities leasing regulations as contemplated by the ECA, together with more detailed guidelines. This would include a requirement to publish site information online, a time limit for the consideration of requests and rules around when site sharing should be considered technically and economically feasible. It would preclude the indefinite reserving of space on masts for the incumbent's equipment and facilitate the quicker roll out of new sites by smaller operators. Accounting separation is also considered as a remedy, to improve transparency around the extent to which pricing is cost-based and remove the ability for large operators to disadvantage smaller rivals through site leasing.
- 204.4. Upstream market 3, roaming: The Authority considers a market for roaming services that has a geographic dimension at least as narrow as local and metropolitan municipal areas areas. This is based on, among other factors,

the nature of roaming agreements in South Africa which have geographic limitations. These markets are ineffectively competitive as only MTN and Vodacom have substantial coverage in many municipalities. From a network capacity perspective, measured by number of network sites, MTN is dominant (has a market share of 45% or more) in 34 local and metropolitan municipalities, Vodacom is dominant in 86 and MTN and Vodacom both have a market share exceeding 45% in 15 municipalities. The Authority considers the following pro-competitive licence conditions as appropriate in the circumstances: (i) Mandating a roaming offer for parties dominant in particular geographic areas. (ii) Accounting separation: At this stage the market is changing and as such price regulation may be premature. However, in order to enhance transparency and ability for the regulator to monitor, functional accounting separation should be implemented. This is to split out all network related inputs needed to provide roaming as though the dominant operator used roaming as an input when providing its own retail services.

- 204.5. Upstream market 4, MVNO and APN services: The Authority does not definitively define markets, assess the effectiveness of competition and significant market power and consider pro-competitive licence conditions where MVNO/APN services are concerned since any competition concerns in this layer can be remedied upstream at the site access and roaming layers. Nonetheless, concerns have been raised in respect of MVNO and APN services. The Authority analyses MVNO and APN services together, since they can be used as substitutes by MVNO and reseller customers to some extent. There are indications that the supply of these services is ineffectively competitive since there is at present only one provider of wholesale MVNO services even though all MNOs could offer these services and APN prices are high relative to retail prices. While the Authority is concerned about ineffective competition in markets for APN/MVNO services, the Authority does not make a finding in respect of market power in this market. Any market power in the provision of MVNO

and APN services is a result of market power at the sites and roaming levels and is likely linked to dominance in retail markets. Remedies imposed in those markets are likely to mitigate any market power for APN/MVNO services and there is therefore no need to conclude on market power in respect of APN/MVNO services. The Authority considers that the remedies in markets for site access and roaming services are likely to improve competition in markets for MVNO/APN services. The Authority will monitor progress in the supply of MVNO/APN services while these remedies are in force and reassess whether further intervention is needed if the upstream remedies are not effective.