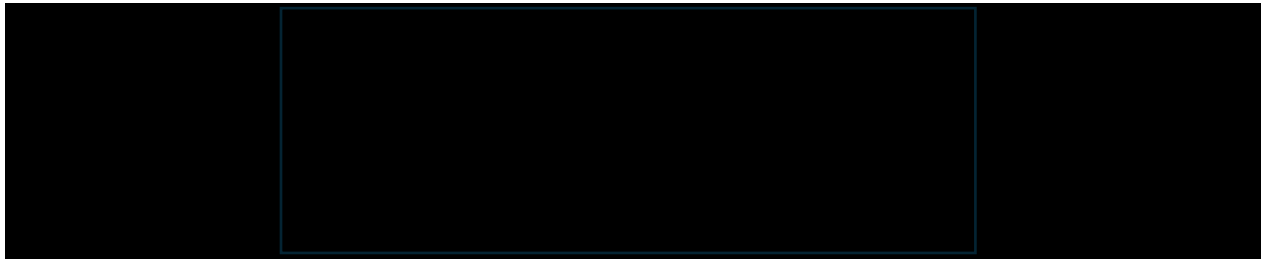


COMPETITION ANALYSIS REPORT

iMOBILITY (PTY) LTD



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1. Abstract

Competition in mobile telecommunications markets has become an increasingly important theme as economies strive for more competitive outcomes to maximise the potential for expanded services¹, lower prices, and increased innovation. Over the past 19 years, the effective duopoly in the South African mobile telecommunications market was interrupted by the entry of Cell C in 2001, Telkom Mobile in 2010, and Rain Networks in 2017. This research assessed the impact of entry on the nature of competition in the South African mobile telecommunications market, using Rain Networks as a case study.

Using bi-annual data on mobile data headline prices and promotional offerings from 2020 to 2019, we analysed price-based competition by (i) employing a simple price comparison methodology of the 1GB and 5GB data-bundle plans offered by each of Vodacom, MTN, Cell C, Telkom, and Rain Networks and (ii) calculating effective prices using data on promotional offerings and discounts offered by mobile operators on their 1GB and 5GB data-bundle plans in the same period.

The research went further to analyse the nature of competition on non-price factors such as coverage, quality, reputation, and brand awareness between the mobile operators. While we studied found no obvious response from competitors to the entry of Rain Networks on headline prices, the assessment on promotional offerings demonstrated much more vigorous competition among the operators through lower prices and product variety.

We also found evidence of competition on non-price factors among operators. Furthermore, although the impact of the entry of Rain Networks had been effective in inducing ability and willingness among customers to switch and inciting a response from competitors in the form of new product offerings and reduced prices to the benefit of consumers, such impact was limited to only a segment of customers and did not reduce overall prices of mobile data.

Keywords: competition, South African mobile telecommunications market, Telkom Mobile, Rain Networks, price competition, mobile data, effective prices.

¹

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2. Overview

South Africa is in the forefront of most of its counterparts in the Continent in access and usage indicators against which it is benchmarked. Yet, communications services are not affordable to the majority of South Africans with;

- South Africa still needs to do a lot in achieving universal access and sufficient intensity of use for network effects to snowball is affordability. Affordability of telecommunications depends primarily on the price (determined by the input costs and profit margin of the operator) as well as the user's disposable income.

Internet-based services provide cheaper communication alternatives, and operators are currently investing in infrastructure to improve their network quality, coverage and access, leading to nearly 100 percent of the country being covered by 3G networks. However, data services and products are still unaffordable to almost half of the South African population. While mobile phones are the most popular device used to access the Internet in South Africa, the cost of the device is the main barrier to those not connected to or accessing the Internet.

The main factor limiting increased use is the price of data. Price-sensitive feature and smartphone users are increasingly supplementing their purchases of their high-value, low-denomination bundles with public Wi-Fi. Thirty-two percent of Internet users indicated they used public Wi-Fi at least once a month, with women demonstrating greater use at 32 percent compared to men (30%).

The costs to communicate in South Africa have historically been high, particularly in respect of broadband services. Consumers and Government have been putting a growing pressure to reduce these costs. The regulator, the Independent Communications Authority of South Africa (ICASA) has also weighed in on the fight. Two recent proposed transactions, the Vodacom/Liquid Telecoms (ICASA, 2014) merger and the MTN/Telkom network sharing deal².

In July 2017, a new competitor, Rain Networks, backed by businessmen Patrice Motsepe, Paul Harris, and Michael Jordaan, made its debut in the South African telecommunications market as the fifth telecommunications operator. Rain Networks was established following the acquisition of Wireless Business Solutions Holdings (WBS) by Multisource Telecoms

² Laurie, 2014

(Multisource). Through the transaction, Rain Networks inherited radio frequency spectrum in the 1800MHz and 2.6GHzZ bands³. Traditionally, MNOs enter the market at multiple levels of the value chain, operating the network infrastructure and providing network access in the upstream market and providing retail services in the downstream market. What is interesting about the Rain Networks story is that, unlike the other MNOs, which offer traditional voice, message and data services, Rain Networks entered the market as a data-only provider, providing an LTE-A mobile network designed to meet the growing demand of South African consumers.

In 2019, with access to high-frequency spectrum, Rain Networks was the first South African operator to launch 5G network. Rain Networks was able to achieve this even though the licencing of 5G network had not yet been activated by ICASA through the allocation of additional radio frequency spectrum. This placed Rain Networks ahead of market incumbents, MTN and Vodacom. The operator has penetrated the telecommunications market as a non-traditional entrant with a unique and competitive offering⁴.

Regulatory Framework of the South African Mobile Telecommunications Market

With the evolution of telecommunications industries across the world, there has been an increase in competition, as new players enter the market. The benefits of increasing competition in this industry are enormous, given the pervasive impact of telecommunications on the competitiveness of all firms and sectors (Irvine and Granville, 2009). It is accordingly essential to have comprehensive regulations governing aspects such as technical standards, licencing and access to new technologies, networks, infrastructure, and spectrum allocation.

In South Africa, the telecommunications market is regulated in terms of the Electronic Communications Act (ECA). ICASA was established as the industry regulator in terms of the Independent Communications Authority of South Africa Act. ICASA regulates broadcasting, communications and postal services sectors. As a sector regulator, ICASA is responsible for implementing and enforcing 'ex ante' regulation, which refers to explicit market intervention by the regulator 'before the

³ Tubbs, 2015

⁴ Bell and Bosiu, 2019

fact'. This implies regulation that is put in place to establish conditions within the industry to ensure that the market functions optimally (Fourie, Granville and Theron, 2015).

ICASA is responsible for ensuring non-discriminatory access to necessary inputs, in particular network infrastructures, and has the power to promulgate regulations or impose license conditions aimed at addressing the conduct of licensees. ICASA provides economic regulation in several areas including interconnection, facilities leasing, spectrum management and universal service, access, competition, and price regulation.

The Competition Act establishes the Competition Commission which investigates and evaluates restrictive practices, abuse of dominant position, exemptions, mergers and conducts market inquiries. The Competition Act also establishes the Competition Tribunal as an adjudicative body over competition matters and the Competition Appeal Court which considers appeals from or reviews for decisions of the Competition Tribunal. The Competition Commission is responsible for 'ex post' regulation which refers to implicit market intervention and entails detecting, investigating, and remedying anti-competitive behaviour.

Competition policy seeks to achieve efficient, effective, and competitive markets by ensuring easy entry and exit from the market, incentivising firms to compete on price, product and service quality, and that dominant firms are prevented from acting unfairly in a way that reduces competition.

3. The Nature of Competition in Mobile Telecommunications Markets

The key policy objective for mobile telecommunications markets is to establish sustainable competitive markets. This objective is challenged by characteristics of telecommunications markets that favour the concentration of market power in the hands of incumbents through barriers to entry, strong network effects, large sunk costs of essential facilities, brand recognition and loyalty, and first-mover advantages that provide incumbents with economies of scale, established networks, large subscriber base, deep pockets, and market experience⁵.

⁵ Hawthorne, *et al.*, 2020.

The barrier-to-entry feature of telecommunications markets poses great challenges to potential competitors and frustrates efforts to counter the continued dominance of incumbents. In a study on the barriers to entry and expansion of the South African telecommunications market, Hawthorne *et al.* (2020) found that issues such as cumbersome requirements to obtaining operating licences, delays in allocating spectrum, and poor enforcement of regulations were just some of the critical barriers that limited the ability of new operators to enter the market and compete.

New entrants into telecommunications markets also encounter other obstacles such as sunk costs that make entry difficult (Roberts, 2020 and Xiao and Drazem, 2011). Building on the Bresnahan and Reiss methodology, Xiao and Drazem (2011) examined the competitive effect of the fourth entrant into the local US broadband market by assessing whether entry costs varied with timing of entry. They found that sunk costs of entry were lower for earlier rather than later entrants thereby making entry conditions for the fourth and later entrants more difficult. The analysis highlighted the importance of sunk costs in determining entry conditions. It showed that high entry costs constrain entry and delay stabilization of new entrants and their ability to timeously recover their return on investment.

Mobile telecommunications markets are also a paradigmatic example of an industry where network effects and switching costs drive market competition⁶. research on network effects has focused either on the impact of network effects on mobile telecommunications diffusion or on the role of network effects on the understanding of how users make their choices on mobile communications. For instance, Fuentelsaz Maicas and Polo (2010) analysed how switching costs and network effects separately influence prices and competition in the European mobile telecommunications market. They found that competition was lower in markets that exhibited network effects and high switching costs. Birke and Swann (2006) in Maicas and Sese (2011) explored the role of network effects in consumers' choice of mobile service providers in the UK and found that the choices of individuals were heavily influenced by the choices made in the individual's social network.

First-mover advantages are also important in telecommunications markets. They arise because of direct network effects, switching costs and economies of scale and have the potential to deter entry and affect competition in the market (Hawthorne, *et al.*, 2020). While there are many new market entry opportunities in the telecommunications markets, the previously duopolistic state of these markets cannot be ignored. Studies have shown that entry costs for early entrants are

⁶ Maicas and Sese, 2011.

lower than for later entrants, enabling both first-movers and incumbents in the telecommunications market to be more successful (Xiao and Drazem, 2011; Jakopin and Klein, 2012; Muck and Heimeshoff, 2012). Fernandez (2021) found that incumbents possessed cost-side advantages in terms of deployment of infrastructure, which allowed them to have a stronger competitive effect over later rivals.

Due to first-mover advantages, incumbents were most likely able to secure access to the best mobile sites while late entrants needed time to build a reliable network. This created coverage differences that put late entrants at a disadvantage. We also found that incumbents were more likely to have control over scarce resources and could exercise strategic actions aimed at preventing entry of new entrants or inhibiting expansion of smaller competitors.

The impact of lead time is important for the success of new entrants in markets exhibiting network effects. The research of Gruber and Verboven (2001) showed that the actual timing at which first entry licences are issued, and the introduction of second entry licences (competition), had a significant impact on the diffusion of mobile telecommunications. Huff and Robinson (1994) found that first entrants could gain sustainable market share advantages and while second entrants were able to eliminate some of the incumbent firm's market-share advantage, the third and later entrants continued to trail the pioneer and were not able to erode the market share advantage, even in the long run.

Hawthorne and Grzybowski (2019) made a similar finding when assessing the competitiveness of the telecommunications service in South Africa. They found that, while there may have been some initial price competition between operators since the entry of Cell C and Telkom, these competitors had not been able to significantly constrain the market incumbents, MTN and Vodacom.

4. The Impact of Entry into Mobile Telecommunications Markets

The entry of new competitors leads to price reductions by putting more competitive pressure on market incumbents (Tirole, 1988 in Bresnahan and Reiss, 1991, Jeanjean, 2013 and Grzybowski, Nicolle and Zulehner, 2021). Entrants may affect incumbents by diverting demand from the incumbent thereby abstracting market share away from them and by reducing prices to penetrate the market, in effect, intensifying competition among market participants. Economists agree that there are substantial consumer gains that can result from entry of new competitors in a market⁷.

⁷ Laffont and Tirole, 2000 in Gruber and Verboven, 2001, Roberts, 2020, Valaskova, Durica, Kovacova, Gregova and Lazaroiu, 2019 and Genakos, Valletti and Verboven, 2021.

Economides, Seim and Viard (2008) evaluated consumer welfare effects of entry resulting from price reductions, development of new service offerings, and quality differences between the incumbents' and entrants' services. Their study showed that although households benefitted from price reductions because of the entry of two operators into the local phone service, they derived greater benefit from the entrants' new plan types and quality differences than from the incumbents' services. Bourreau, Sun and Verboven (2021) found that firms reacted to competition of new entrants by introducing (subsidiary) brands as a competitive strategy in a segment of the market which they previously didn't serve while Ellis and Singh (2010) found that the introduction of competition in the mobile markets drove the rollout of services, increased market penetration, and reduced prices. The findings of these studies have shown that entry induced firms to increase and enhance their offerings thereby delivering better market outcomes.

While economists have long held that firms' market power to set prices above marginal cost is inversely related to the number of firms competing in the market, establishing the number of competing firms necessary to ensure effective competition has remained a challenge for regulatory authorities across the world (Xiao and Drazem, 2011).

Studies by Bresnahan and Reiss (1991), Xiao and Drazem (2011) and Hounghonon (2015) have revealed that in markets with five or fewer incumbents, almost all variation in competitive conduct occurred with the entry of the second and third firm. They found that there was a fall in prices when the second and third firms entered but that the fourth entrant had little effect on competitive conduct. Their findings suggest that entry conditions become increasingly more difficult for the fourth and subsequent entrants, implying that new entrants beyond the first three firms could have little effect on competitive conduct in the market.

The studies on the impact of entry on prices and competitive outcomes highlight the importance of understanding the dynamics in different markets, to assess whether entry of additional competitors would yield the desired competitive outcomes. These results are particularly relevant for this research which sought to assess whether the entry of a fifth competitor resulted in effective competitive outcomes in the South African mobile telecommunications market.

5. Assessing the Impact of Rain Networks on the Nature and Effectiveness of Competition in the Mobile Market

5.1. Assessing Price Competition in the Mobile Data Market

One of the critical data points used to assess competitive outcomes and the impact on consumer welfare is price. Mobile data prices are increasingly used to assess Internet service affordability, among other variables that contribute to affordability measures (research ICT Africa, 2019). Over the past years, the South African mobile telecommunications market, which had long been protected by a strong network effect, was altered by the entry of new mobile operators. This gave customers a wider range of mobile service providers to choose from. In line with economic theory on market structure and competition it would not be unusual to expect that in the presence of increased competition in the market, the prices of data for consumers would be low.

An assessment of headline prices of the 1GB data bundle in Figure 1 shows that headline prices were stable in 2020 and 2021, with some changes building up towards 2024.

From 2021 to 2024, the headline price of a 1GB data bundle in South Africa saw a significant reduction, with major mobile operators like Vodacom, MTN, and Cell C cutting prices to around R85.

Here's a more detailed breakdown:

2021:

- Vodacom and MTN reduced their headline 1GB data prices to R85.
- Cell C also matched the R85 price for a 1GB bundle, with an extra 1GB for late-night use.
- Telkom cut its ad hoc data prices, offering a 1GB bundle for R79.

2024-2023:

The R85 headline price for 1GB data became well-entrenched as a standard across the industry.

Mobile operators continued to offer various data bundles and promotions, with some offering extra data for specific uses or at certain times.

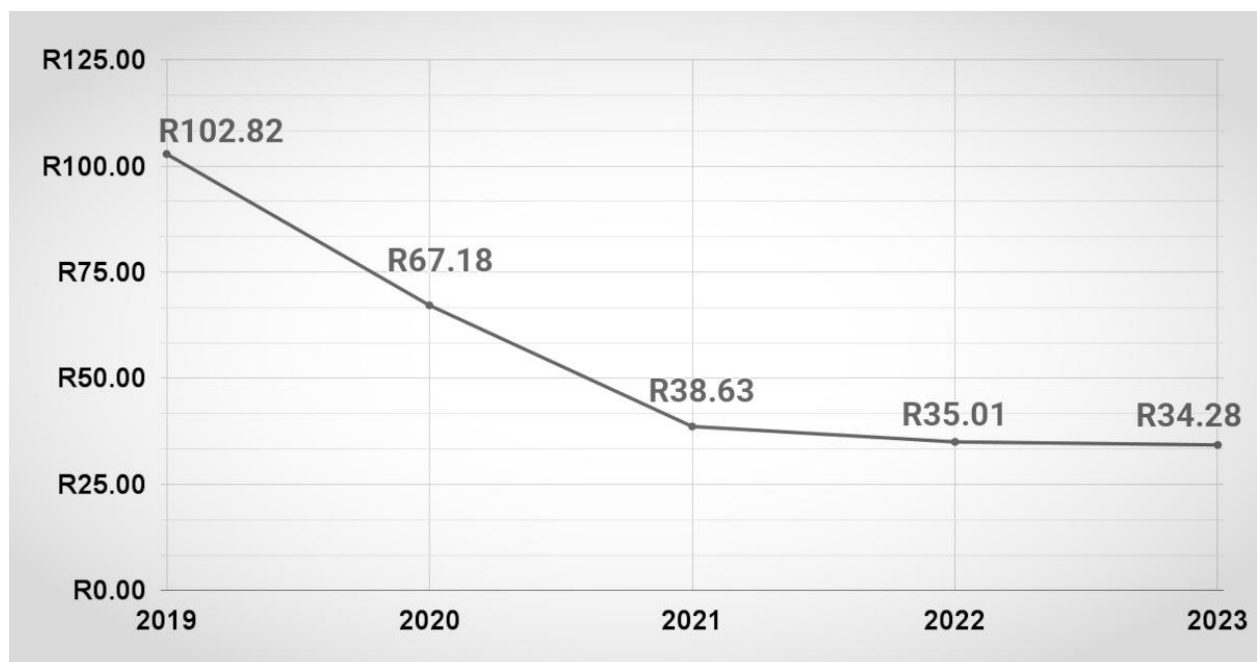
2024:

Vodacom and MTN continued to offer 1GB data bundles at R85, with various promotions available.

MyBroadband⁸ reported on February 4, 2025, that Afrihost Air Mobile offers a 1GB data bundle for R30, Shoprite K'Nect Mobile for R39 (R19.50 with MoneyMarket account), Axxess Mobile for R39, and Capitec Connect for R45.

Vodacom also offers a 1GB monthly data bundle for R86, R57.99, R29.00, and R11.99, with new prices of R92.00, R63.50, R34.50, and R18.00 respectively.

Figure 1: Headline Prices of the 1GB data bundle - 2019 to 2023⁹



In South Africa, the average price for 1GB of mobile data decreased from around \$2.67 in 2021 to \$1.81 in 2023, despite the rand weakening significantly during that period.

⁸ MyBroadband

⁹ Source: MyBroadband Report

Until July 2021, when Rain Networks entered the market with its 1GB offering for R50, Telkom offered the cheapest 1GB data bundle at R99, with no apparent competitive response from the other operators. In that period, MTN's offer was the most expensive at R160 while Vodacom and Cell C offered their 1GB data bundles at R149. The lack of response from the mobile operators to Telkom's price suggested that the operators considered Telkom's offering to be of lower-quality and did not regard Telkom a big enough threat to attract customers away. This, regardless of Telkom's offering being the lowest-priced.

Rain Networks entered the market in mid-2021 offering a 1GB plan at R50, making it the cheapest among the mobile operators. After prices of the 1GB data bundle had remained unchanged for over twenty (20) months, the market saw the first movement in prices six months after the entry of Rain Networks, when MTN discontinued its 1GB plan in January 2018 and replaced it with the 1.5GB bundle at R189, effectively reducing the price by 21% to R126 per GB. The next reaction in the market happened in the third quarter of 2018, twelve months after the entry of Rain Networks, when Cell C announced the discontinuation of the 1GB data bundle and the introduction of a new 1.5GB plan at the same price of R149. This effectively reduced the price of Cell C's offering by 34% per GB to R99, just R1 lower than Telkom's offering.

The fact that MTN and Cell C responded to Rain Networks's entry with lower prices but had not responded to prices set by Telkom, suggested that the operators did consider Rain Networks's offering to be of higher-quality and perhaps a credible threat which could attract customers away from them. In 2018, MTN discontinued the "loss generating" 1GB offering (MTN, 2019, p. 25). The fact that Vodacom did not react to Rain Networks's lower prices suggested that Vodacom did not see Rain Networks as a credible competitor and was not threatened by the new entrant. The differential extent to which MTN and Vodacom experienced consumer switching is considered below. Important to note is that while the growth of Rain Networks's overall number of subscribers was negligible, Telkom had grown its share of mobile subscriber.

Notwithstanding the reduction in prices of the 1GB data bundle by MTN and Cell C, there remained a significant price differential between Rain Networks's offering and that of the next cheapest and the most expensive of almost 66% and 99%, respectively.

As shown in Figure 2, there was a similar picture in the 5GB market. Telkom's offering had remained the lowest at R299 between 2020 and 2021 with no reaction from the other operators. In that period, MTN's offering was the most expensive at R430 followed by Vodacom and Cell C whose 5GB data bundles were both priced at R399. In 2021, Rain Networks entered the market offering the 5GB data bundle at R250 making it the cheapest offering. MTN discontinued the 5GB data bundle in January 2018 (hence a combined basket of the 2GB and the 3GB data bundles, with higher prices, is reflected in the table for MTN customers from January to June 2018).

MTN introduced a 6GB data bundle to replace the discontinued 5GB bundle in July 2018 thereby effectively pricing its 5GB at R332.50. In July 2018, Cell C also replaced the 5GB but with a 6.6GB data bundle at the same price of R399, effectively reducing the price of its 5GB to R307. Vodacom made no change in that period.

Figure 2: 1GB Data Bundle Price Trend¹⁰

Carrier	~1GB	Price per MB
Vodacom	R89 (1.2GB)	0.07c
MTN	R85	0.09c
Telkom	R79	0.08c
Cell C	R65	0.06c
Rain Go	R50	0.05c
Average		0.07c

A similar inference can be drawn from the reaction of MTN and Cell C and the non-reaction of Vodacom, about their respective perceptions of Rain Networks's credibility as a competitor. However, unlike in the 1GB market, the price differentials between Rain Networks's offering and that of the next cheapest and most expensive provider were much smaller, at almost 18% and 46%, respectively. This suggested that Rain Networks's offerings were attractive to this

¹⁰ ICASA Database based on Filed Tariff Notifications

segment of consumers who were high-end users of mobile data, and, consequently, Rain Networks posed a greater competitive constraint in the 5GB market and attracting customers away from the other operators.

While there had been some competitive responses by mobile operators reflected in lower prices for the 1GB and 5GB data bundles, Vodacom made no change in headline prices. This is consistent with the observations of the Competition Commission (2019, p. 81) which found that price competition in the mobile data market was inadequate as MTN and Vodacom had been able to sustain high prices even in the presence of smaller operators such as Telkom who offered data plans at much lower prices.

Market participants however, argued that headline prices were not a true reflection of the extent of competition in the mobile data market because mobile operators did not compete on headline prices. The mobile operators, including Vodacom, made the same assertion to the Competition Commission (2019, p. 84). MTN and Telkom indicated that prepaid customers were extremely price sensitive and because they were not committed to any specific mobile operator through a contractual agreement and thus were easily able to switch between mobile operators without the fear of incurring switching costs or losing their mobile number thanks to number porting. Furthermore, the operators asserted that customers were multi-homing which enabled them to own multiple SIM cards of different mobile operators and take advantage of the competitive offerings of the different mobile operators at different times. Mobile operators were thus offering customers competitive promotional discounts to attract new customers and to retain existing ones. Accordingly, market participants believed that while there had been little variation in headline prices, there had been much more vigorous competition for effective prices through promotional offerings by mobile operators.

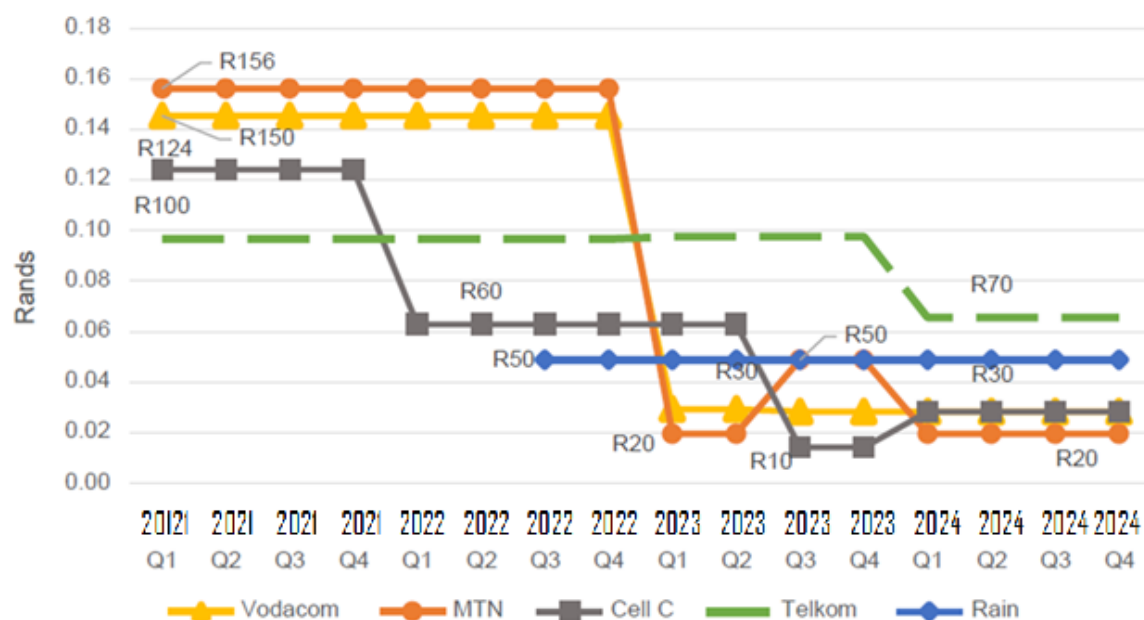
In the 5GB to 6GB data bundle range, Vodacom's introduction of its 5GB at a retail price of R 279 has made the bundle the lowest priced among the MNOs that offer the 5GB data bundle, followed by MTN at R 299 and lastly Telkom Mobile at R 314. Therefore, MTN and Telkom Mobile charge R 20 (or 7.2%) and R 35 (or 12.5%) higher than Vodacom, respectively. Cell C still offers a 6GB data bundle which is priced at R 299. Therefore, in terms of in-bundle rates in the 5GB to 6GB data bundle range, Cell C and Vodacom offer more value for money at R 0.05 per MB compared to MTN and Telkom Mobile's R 0.06 per MB in-bundle rates. In addition, it should also be noted that Vodacom's 7.5GB (priced at R 379) has an in-bundle rate of R 0.05 per MB.

Promotional offerings for mobile-data services

Data from this research showed that the number and extent of promotional offerings of mobile operators increased significantly prior to the entry of Rain Networks. From around 2021, mobile operators introduced more offerings targeted at different segments of customers including mid-night surfers, social media users, and content streamers than they did in 2020. These promotional offers suggested a competitive response by the mobile operators to the entry of Rain Networks, to the benefit of mobile-data intensive consumers.

With the increasing role of Over-the-Top “OTT” content, messaging and voice providers, who used open Internet-based communication rather than existing operator-controlled cellular services, mobile operators had to find innovative ways to capitalize on the growth of OTTs and maximize their revenues (Odendaal, 2018). Over the last few years, mobile operators began forming partnerships with different OTTs to provide their customers with targeted products and services. Through partnering with social media OTTs such as Facebook, Instagram, and WhatsApp, mobile operators were able to introduce various promotional offerings to attract customers (Odendaal, 2018). These groups of customers were largely young and heavy consumers of social content who wanted more data at the lowest prices. In South Africa, WhatsApp ranked the most popular and most widely used social media platform at 57% followed by Facebook at 47% (Silver, Smith, Johnson, Jiang, Anderson and Rainie, 2019). Mobile operators had responded to this demand with WhatsApp-specific promotional offerings, predominantly in the 1GB market. This bundle also allowed customers to have access to WhatsApp for a period of 30 days, sending and receiving text messages, videos, and audio files via their platform (but excludes voice and video calling) (MyBroadband, 2018a). Customers were charged standard rates when using other applications and when making calls.

Figure 3: Effective Prices of the 1GB WhatsApp-Data-Bundle Promotions



Among the operators, Cell C was the only operator that offered its customers a WhatsApp data-bundle promotion from 2020. The promotion offered Cell C customers 1.2GB usage at R124 per GB, which was effectively 17% lower than what a customer would pay for a standard Cell C 1GB data bundle. The price of Cell C's WhatsApp offering fell further to an effective rate of R60 per GB after it was amended. Until 2021, Cell C's offering was the most attractive for WhatsApp users. Neither MTN nor Vodacom responded to Cell C's low price, suggesting that even with that promotion, Cell C was not perceived a sufficient threat to draw away the incumbents' customers, who preferred higher quality, were less price sensitive, wanted reliable offerings and perhaps considered Cell C's offering to be of a lower-quality which was not a good enough substitute.

Just six months after Rain Networks entered the market, both MTN and Vodacom dramatically reduced prices of their social media promotions. For WhatsApp-focused promotional data bundles, MTN dropped its effective rate from R156 per GB to R20 per GB, while Vodacom's promotional price was set at R30 per GB, dropping it from R150. Both offerings were lower than Rain Networks's standard 1GB price, indicating that the response by the incumbents was induced by the new entrant. In the third quarter of 2018, Cell C reduced their price below all the operators and then increased it in the first quarter of 2019 in line with Vodacom's offering. Until 2019, Telkom was the only operator that did not offer a WhatsApp-specific promotional bundle. For Telkom, WhatsApp was considered a standard product and because their prices were already much lower, the operator did not offer the promotion. However, in the first quarter of 2019, Telkom

began to offer customers a free 500MB WhatsApp bundles when they purchased a 1GB FreeMe bundle thereby effectively reducing Telkom's rate to R70 per GB. Even with the promotion however, Telkom's offerings still remained higher than Rain Networks's standard offering.

The picture for 'promotions' reflected in Figure 4 below was quite different to that in Figure 1 on headline prices. In contrast with the headline prices, the effective prices for WhatsApp promotions were reduced significantly for this customer segment, with MTN, Vodacom, and Cell C charging lower than Rain Networks. Through promotional offerings, customers of these mobile operators were paying less than half of what they paid for a standard 1GB data bundle. The response by Vodacom on promotions was strikingly different to that on headline prices and suggests that perhaps Rain Networks was perceived to be a worthy competitor in this narrow customer segment, taking into account that WhatsApp was the most active social media platform in South Africa (Kemp, 2019, p. 73).

A similar pattern was seen in the 1GB Social Media Bundle promotions. These promotions operated the same way as the WhatsApp promotion and gave customers access to social media platforms such as Facebook, Instagram, Twitter and Tik Tok, at reduced rates.

When Rain Networks entered the market with its offering of R50 per GB, Vodacom's effective price remained the lowest among the operators. MTN and Cell C both reduced their effective prices through these promotions. In the second quarter of 2018, MTN reduced its effective prices, through its MyOffers promotion, by 63% to R30 per GB, beating both Rain Networks and Vodacom's offerings. Cell C followed in the third quarter of 2018 with a promotional offering on the 6GB bundle that effectively reduced the price to R15 per GB, beating the offerings of the incumbents and that of the new entrant.

Telkom was once again the last operator to respond, with the introduction, in the third quarter of 2019, of its LTE / LTE A once-off data promotion. The promotion effectively offered customers double data at R10 per GB which was the cheapest offering in the market during the relevant period. Notable, once again from Figure 5, was the timing of the introduction of these promotional offerings. MTN's response suggested that it was at risk of losing customers because of Rain Networks's entry. Although MTN had not responded to Vodacom's low price, the offerings of the new entrant could have induced MTN's customers to switch either to the new operator or even to Vodacom. While MTN's price aligned closely to those of Vodacom and Rain Networks, Telkom's price fell much lower than Cell C's, suggesting that Telkom

was responding more to Cell C and perhaps did not consider itself a close enough competitor of the other three operators.

Both Cell C and Telkom seemed to be mostly affected by the increased competition for this segment of customers and were responding with substantially lower prices to retain their customers who may have been willing to switch and forgo the lower price for better service quality, albeit at a slightly higher price.

Similarly, content-streaming promotions were also widely contested and mobile operators had also been able to introduce promotions on platforms such as Showmax, YouTube, Netflix, and other music and gaming channels, to cater for the 5GB segment, who were largely content streamers and high-data users. Via these platforms, the promotions enabled customers to stream series, movies, music, kids' entertainment, sport, news, and live TV channels on their computers or mobile devices.

Once again, there were almost no promotions on content streaming prior to the entry of Rain Networks. The first effective price reduction happened in the third quarter of 2021 when Cell C increased the size of its social-media bundle, giving customers an additional 3GB on the 5GB shaped bundle and thus reducing the effective rate to R60 per GB, 60% lower than their standard 1GB data bundle. When Rain Networks entered the market, its offering of R50 per GB was lower than that of Cell C's promotional offering. Telkom was the first operator to respond to Rain Networks by introducing a promotional offering specifically for content streaming. Telkom's LIT bundles reduced its effective rate by 33% from R60 to R40 per GB, which was R10 lower than the entrant's price.

MTN and Vodacom followed Telkom, and both introduced their content-streaming-data-bundle promotions in the third quarter of 2018, exactly one year after the entry of Rain Networks. Vodacom's promotional bundle reduced their effective price to R50 per GB, matching the price of Rain Networks's standard data bundle. MTN's promotion reduced its price to well below that of Telkom, to R30 per GB. This was a 75% reduction from the R120 that customers were paying per GB for MTN's standard data bundle. The fact that MTN dropped its price below that of Telkom suggests that MTN was responding to Telkom than to Rain Networks. The drastic response by MTN suggested that they are severely affected by competition for this group of customers and were having to respond with significantly lower prices to retain its customers.

An analysis shows that Rain Networks's entry increased competition in the market and this reduced mobile data prices. Like the Double-Your-Data promotion, prices on this promotion also appeared to converge around Rain Networks's effective price of R50 per GB, suggesting that the mobile operators were responding to the entrant. Similar inferences could be drawn from the timing of the introduction of the promotions and the perception of the operators about Rain Networks's competitive threat.

Time-based promotions were also a common feature in the offerings of mobile operators. These promotions allowed customers to benefit from cheaper rates when surfing the Internet at different times of the day. For instance, a 1GB Night Owl bundle valid for 30 days allowed Vodacom customers to surf the Internet between 12am midnight and 5am on any day of the week for R66, which was 56% lower than their standard 1GB data bundle. MTN's Night Express, which operated like that of Vodacom, was R59, which was 60% lower than their standard 1GB data bundle. Cell C's Nite data promotion operated slightly differently in that it required customers to purchase a standard data bundle to qualify for additional Nite data, similar to the Double-Your-Data promotions discussed below. A Cell C customer purchasing a 1GB bundle at R100 would get an additional 2GB Nite data effectively reducing the price to R49 per GB. Similarly, a customer purchasing a 6.6GB data bundle at R299 would get an additional 7GB Nite data, effectively reducing the price to R45 per GB. Telkom also launched their 100GB Night Surfer promotion priced at R149, which enabled customers to surf the Internet anytime between 12am midnight to 7am. This promotion gave Telkom customers an additional 2 hours, compared to the night promotions of other operators which end at 5am, and effectively reduces the price to R1.50 per GB, making it the cheapest offering among the operators.

In addition to these promotions, mobile operators also introduced tailor-made offerings based on a customer's buying patterns and profile. Mobile operators used information that was observed, volunteered, inferred, or collected about consumers' conduct or characteristics, to set different prices to different consumers based on what they thought the consumers was willing to pay (OECD, 2018). For instance, Vodacom customers, simply based on their usage patterns, could benefit from paying R99 for a 1GB bundle which was 33.5% lower than the standard 1GB data bundle and R339 for a 5GB bundle which was 15% lower than the standard 5GB data bundle. Vodacom also introduced additional Promotional Data Bundles which offered a personalised set of data bundles based on customers' spending patterns. The mobile operators were also encouraging customers, by offering them additional promotional discounts, to download the operators' own platforms namely, My Vodacom App, MyMTN App, and the Cell C App and Portal, and process their data purchase on those platforms rather than through their normal banking platforms.

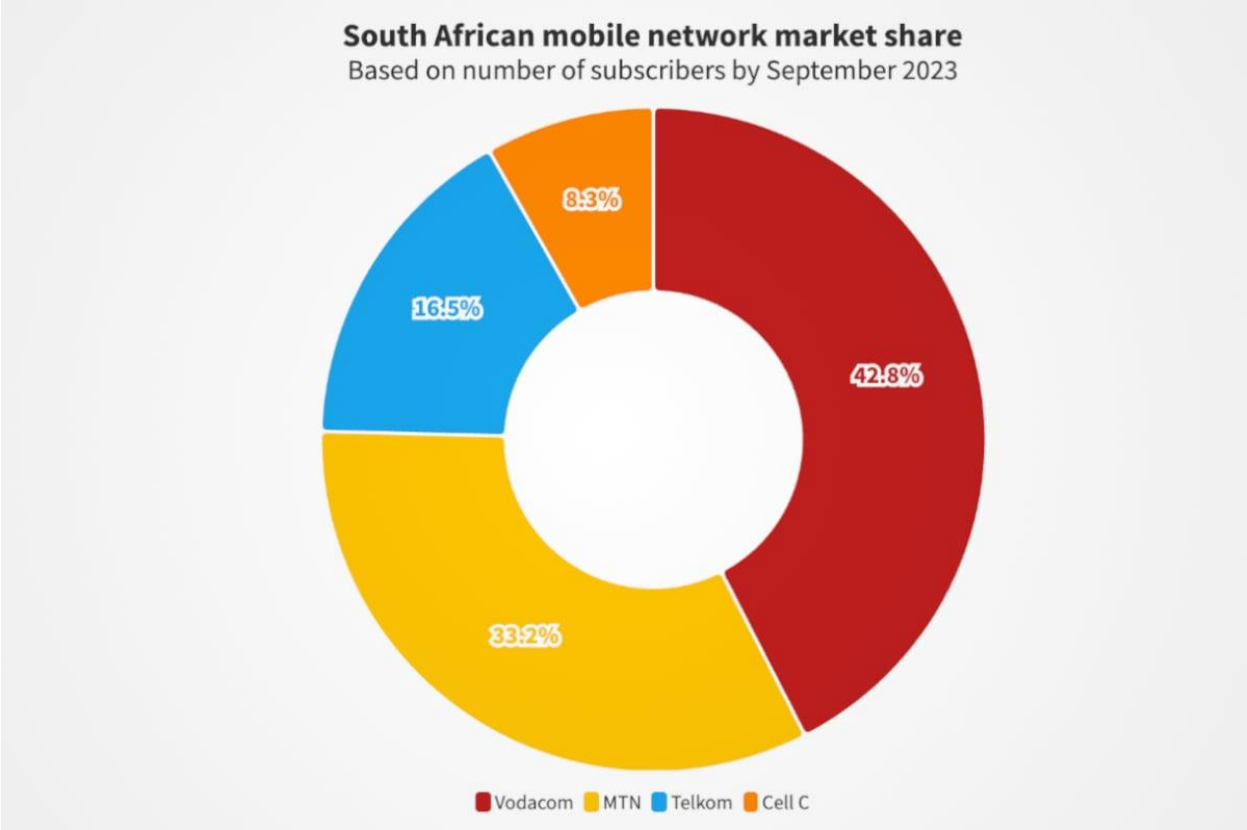
The evidence above seems to support the argument by market participants that there has been much more vigorous competition between the operators on promotional offerings. An analysis of these offerings and discounts revealed that there had been price competition between the mobile operators, which had resulted in a reduction of effective mobile data prices. While there has not been much visible competition on headline prices between the mobile operators, the surge in promotional offerings from the beginning of 2018 was indicative of an increase in competition among them. However, it was not clear what volumes of mobile data sales were made under these promotions and consequently the extent to which the incumbents were able to ring-fence the effects of competition on narrow consumer segments. The research was not able to determine the actual uptake of the promotions and the number of customers that benefitted from the promotional offerings. The fact that the promotions were sustained throughout the analysis period was indicative of a positive customer response to the promotional offerings.

Figure 7 below provides an analysis on Mobile Operator share based on subscribers in 2024. The analysis was limited to prepaid customers because Rain Networks did not operate in the post- paid market. The analysis shows a notable change in the shares of the mobile operators when compared to the 2020 data. This is reflective of a marked increase in competition in the mobile telecommunications market.

6. South African mobile network subscribers and market share

Figure 7: Mobile Operator Share based on Prepaid Subscribers – 2023

	Vodacom	MTN	Telkom	Cell C	Total
2022 subscribers (December 2022)	44.67 million	36.54 million	18.56 million	10.60 million	110.40 million
2023 subscribers (September 2023)	47.26 million	36.80 million	18.29 million	8.20 million	110.50 million
Change	+5.8%	+0.7%	-1.4%	22.6%	+0.1%
2022 market share (December 2022)	40.5%	33.1%	16.8%	9.6%	100%
2023 market share (December 2022)	42.8%	33.2%	16.5%	7.4%	100%



South Africa’s newest MNO — Rain — was excluded from this comparison.

Although the operator launched a fully-fledged mobile network in May 2023, it has not recently reported its subscriber numbers.

MyBroadband asked the mobile network for its latest subscriber numbers in a recent query regarding its biggest achievements of 2023, but it did not provide a figure.

Estimates put Rain’s subscriber number at around 1 million in early 2023.

Rain’s current packages also only allow customers to get a mobile SIM if they have an active fixed-5G package, which would be unnecessary for many households with existing fixed products.

There are no options for standalone prepaid packages for new customers, so although the operator is a true mobile network in the technical sense, its options are limited from a consumer perspective.

6.1. Assessing Non-Price Competition in the Mobile-Data Market

In addition to price competition, mobile operators also compete on various non-price factors. Market participants indicated that quality, coverage, reputation, and brand awareness were the most critical non-price factors against which they compete for customers.

6.1.1. Quality and Coverage

To operate as a fully-fledged nationwide network, mobile operators require access to network infrastructure. Accordingly, a significant focus of competition in the mobile telecommunications market has been on investment in infrastructure required to improve network quality and coverage, and introduce better, more efficient, and faster technologies (MTN, 2019, p. 30). A survey conducted by MyBroadband (2018c), indicated that network coverage, and in particular 4G or LTE coverage, was the most important factor to customers and the main driver for network preference, closely followed by price. Market Participants indicated that the number of sites rolled-out by mobile operators was proportionate to the number of customers that can be serviced therefore, to provide national coverage and provide quality services, operator needed to roll out a substantial number of base sites across the country.

Data on 4G or LTE rolled-out by each of the operators showed that Rain Networks had done well compared to competitors Cell C and Telkom. Instead of trying to build its own infrastructure, Rain Networks entered an infrastructure sharing agreement with Vodacom, which enabled Rain Networks to use Vodacom's sites and facilities to roll out its national 4G or LTE network in line with the facilities leasing regulations of ICASA while it builds its own (Bell and Bosiu, 2019). Having access to Vodacom's national infrastructure has enabled Rain Networks to easily expand its reach and respond much faster to high-demand metropolitan and township areas across South Africa. By the end of 2019, three years after entry, Rain Networks had rolled-out about 3 150 active 4G or LTE sites in the major metropolitan areas, and surrounding townships, of

Pretoria, Johannesburg, Cape Town and Durban (BusinessTech, 2023c). In 2023, Cell C had 2 900 4G or LTE sites in the country (BusinessTech, 2024). By 2021, Vodacom had just over 7 900 4G or LTE sites nationally (BusinessTech, 2021), MTN had just over 11 000 4G or LTE sites in 2019 (BusinessTech, 2019d), while Telkom had just over 2 800 4.5G sites in the same period (Telkom, 2020a, p. 8).

An assessment of coverage revealed that in 2024 Vodacom was the leading operator, providing the widest 4G coverage in the country followed by MTN. Rain Networks was the third largest provider of 4G coverage, surpassing both Cell C and Telkom (MyBroadband, 2024c).

6.2. Assessing the Effectiveness of Rain Networks

Effective competition is concerned not only with the ability to control prices and costs of products and/or services, but also with consumer benefits such as quality of service, the range of services available to consumers, efficient operations in the market, and innovative service provisions (OECD, 2003). Literature has shown that mobile telecommunication markets have distinct characteristics such as first-mover advantages, network effects, switching costs, and entry costs that may hamper the ability of new entrants to effectively compete and yield the desired objectives of effective competition (Hawthorne, *et al.*, 2020, Maicas and Sese, 2011, Fuentelsaz *et al.*, 2010).

6.2.1. First-Mover Advantage: Costs of Entry and Network Infrastructure

Building a national network requires intensive capital investment. This is challenging for new entrants particularly when there is a long lead time between incumbents and later entrants. The Competition Commission (2019, p. 40) found that the lead entry of Vodacom and MTN gave the incumbents significant first-mover advantages over all the other operators and consequently hindered the ability of later entrants to effectively participate in the deployment of infrastructure and contribute towards retail competition. Operators incur substantial costs to roll out sites and can pay anything between R500 000 and R1.5 million per site. Even more is needed to maintain these sites.

The Competition Commission (2019, p. 22) found that one of the biggest advantages enjoyed by incumbents MTN and Vodacom had large subscriber bases and profitability levels, compared to smaller operators, and this provided them with considerable advantage in the rolling out of new technologies and services faster than smaller operators. Rain Networks entered the South African market 25 years after the incumbent operators, Vodacom and MTN. Such long lead times between entry of the first operator and subsequent operators pose challenges for new entrants and smaller operators who are only able to attract less profitable subscribers and so are not able to fund capital expenditure to the same level as the incumbents (Competition Commission, 2019, p. 22). Rain Networks however was able to invest heavily in LTE-A technology which enabled it to provide more data, faster data and better quality data (Jordaan, 2021).

A big challenge facing Vodacom, MTN, Cell C and Telkom, who invested heavily in 2G and 3G infrastructure for the provision of voice services, is that many of their subscribers still use 2G- and 3G-compatible handsets and therefore require the 2G and 3G network. The mobile operators therefore must still maintain their 2G and 3G infrastructure in support of consumers that are still using devices on those networks (van Zyl, 2021).

According to the market participants, the older technology requires far more spectrum to achieve the same speed as an equivalent 4G connection. Consequently, the earlier operators are not able to efficiently utilise their spectrum and are constrained in rolling out advanced technology. As a data-only service provider, Rain Networks has been able to maximise their existing LTE infrastructure to provide data services and host more traffic while other operators are having to re-farm spectrum, to subsidise their data services, that was initially allocated for voice and messaging services..

6.2.2. Network Effects and Switching Costs

Network effects and switching costs favour incumbents and limit the potential of new entrants. Their presence in the market makes it unlikely that consumers will switch to new entrants, particularly where new entrants do not have full coverage and are not able to quickly build full- coverage networks, but also where customers become locked into contracts with incumbent operators (Hawthorne *et al.*, 2020). Firms with market power thus have an incentive to protect their market power by denying their competitors access to customers (Hawthorne, 2014). The negative impact of network effects is more severe in voice services where network operators can discriminate between customers on their own network, and those on rivals' networks, through interconnection fees, call-termination rates, and on-net discounts.

The effects are mute in the data market where closed-network pricing cannot be used as a strategy to exclude new entrants. The fact that Rain Networks offers data only services and does not compete with the other operators in the voice market suggests that the operator is less affected by this type of network effect. This however does not mean that Rain Networks is completely immune to the negative impact of network effect on new entrants. Unlike the incumbents, Rain Networks does not provide national coverage and may be conceived as unattractive to those customers living outside the metropolitan and township areas in which it operates. Therefore, while Rain Networks's product offerings may be attractive and much cheaper compared to those of other operators, they may not be affordable to someone living in rural areas who can only afford to spend R20 a month on data services and to whom a 4G-enabled smartphone may not be a priority. Thus, while national coverage is important, Rain Networks's business model excludes markets where customers are not heavy data users.

On the switching side, the impact of switching costs may be more detrimental to Rain Networks because it must compete for the customers of network operators that offer both traditional services and data services. Because Rain Networks does not offer traditional service offerings, a typical customer would need to be a multi-homer that either switches between

SIMs of different operators, and utilises each SIM for different product offerings, or a consumer that owns a Wi-Fi device. Accordingly, a Rain Networks consumer would still need the services of either an MTN, a Vodacom, a Cell C, or a Telkom for the traditional call-and-messaging service and utilise a Rain Networks SIM solely for data services. The advantage for Rain Networks is that customers do not have to be burdened with the decision to choose between their original mobile operator and Rain Networks because they can have both. Of course, the disadvantage is that not all customers may be willing or able to multi-home, either because switching to a Rain Networks SIM means that a consumer utilising a single device would not be able to receive calls in that period, unless they could afford a second device.

This group of consumers would prefer to stay on their original network and receive all services from a single operator even if one of those services could be obtained cheaper from an alternative service provider such as Rain Networks. In weighing the costs of switching, these customers would not consider Rain Networks an attractive alternative. Furthermore, Rain Networks only offers prepaid services, so, for customers that require an extended period to pay for a Wi-Fi device, mobile operators offering post-paid services may be viewed as more attractive and affordable. Once locked-in, the switching costs of these customers are even higher and switching becomes less likely.

The analysis above shows that Rain Networks has successfully been able to set itself up as a contestable operator in the market. With its targeted offering, Rain Networks has been an effective competitor and has successfully spurred a competitive reaction from its rivals. The responses of the operators have however been discriminatory and limited to only that segment of customers which found Rain Networks's offerings attractive. The assessment of price competition above shows that one of the obstacles that Rain Networks has encountered has been its ability to significantly impact overall prices of mobile data. This is because mobile operators have been able to partition their customers and employ targeted promotions that resulted in lower prices only to the segmented customer base without contaminating the prices of the bulk of their customers to whom they continue to charge high prices.

7. Regulatory Lessons for South Africa : A Country Comparison

The results of this research show that simply opening up markets without adequate complementary reforms does not in itself result in the desired outcome of effective competition and lower prices. Empirical evidence on effective entry in telecommunication markets suggests that policy and regulatory interventions related to licensing, spectrum allocation, infrastructure sharing and tariff regulation (only in the early stages) are necessary in order to enable new entry and

effective participation as well as to manage the potential anti-competitive behaviour and actions of incumbents (de Bijl and Peitz, 2000).

In its report, the Competition Commission similarly identified areas of spectrum allocation, facilities leasing and roaming charges as needing intervention in South Africa in order to provide immediate relief to high prices and to improve mobile price competition (Competition Commission, 2019, p. 247). There are key lessons that can be learned from the experiences of countries such as Sri Lanka and Pakistan that have introduced regulation on these specific aspects – even if for a short while – and have been successful in enabling entry, creating competitive markets and achieving low mobile data prices.

7.1. Case Study I: Sri Lanka

Sri Lanka is one of the leading examples of countries that have achieved good results from comprehensive reforms. The internet comparison site Cable (Cable, 2021) reported that Sri Lanka ranked 9th globally amongst countries with the cheapest mobile data. In comparison, South Africa ranks 135th out of 221 countries on that list. Sri Lanka's success is a direct result of fierce competition among the five mobile operators¹ operating in the Sri Lankan market. One of the main drivers that enabled effective competition in this market has been the quick allocation of spectrum. The Sri Lankan regulator was one of the first in the Asian region to make 3G spectrum available back in 2004 when it authorized its use for testing. By 2006, this spectrum was allocated for commercial use to all operators at a charge of around USD 5 million (Galpaya, 2011). Not only was 3G spectrum made available at the time, but was thereafter available to any operator who paid the same price.

This eliminated “land-grab” type behavior that would have been otherwise created by a once-off spectrum auction and enabled operators to enter the 3G market when it made most sense to them – based on their assessment of trade-offs between early entry vs. waiting for the right time in their capital investment cycle. While the government may have lost potential income through this allocation method, it did make spectrum available on a non-discriminatory basis to all operators, and at a relatively low price. Through this intervention, the Sri Lankan government was able to remove one of the most significant barrier facing new entrants in mobile telecommunication markets and enabled operators to quickly invest (Galpaya, 2011).

The second key driver of low mobile data prices in Sri Lanka has been the spur of innovation.

Once the Sri Lankan market got beyond the duopoly situation, the disruptive entry of the third and fourth mobile operators introduced serious competition. In order to maintain margins and grow the market, mobile operators could no longer continue to only service high-end users who have high ability and the willingness to pay but had to reach the lower-end consumers. The mobile operators had to find innovative ways to cater to variable incomes of the low-end users by introducing smaller and cheaper bundles on pre-paid services. Mobile operators in Sri Lanka have also had to be innovative in reducing their network costs by, for example; outsourcing network operations and sharing of passive and active infrastructure, without regulatory obligation (Galpaya, 2011).

In the presence of intensive competition that results in low prices and consequently lower profits, mobile operators may be tempted to reduce the quality of services to the detriment of consumers. Having realised the importance of high-speed data, the Sri Lankan government has commenced carrying out data tests to measure advertised speeds against actual speeds and has introduced legislation aimed at boosting coverage and service quality (Barton, 2021).

8. Key Lessons

There are key lessons can be drawn from the successes of these countries which may be particularly relevant in South Africa. The first lesson is to ensure that availability of spectrum is not a barrier. It is important to understand that spectrum is the primary resource required for mobile data that is not within the control of the operators and therefore regulators should make this available early, and on a non-discriminatory basis, regardless of the allocation method. The second lesson is to enable competition in the market by facilitating entry. The fact that the mobile data prices of these countries are amongst the cheapest globally shows what a competitive telecom market can achieve. When “enough” competitors enter a country (certainly more than two, ideally more than three), disruptive competition takes place yielding innovation that enable affordable mobile data. The third lesson is that there is a need for some regulation that is aimed at preventing incumbents or firms with market from abusing their power and at protecting consumers.

9. Conclusion

This research assessed the impact of a new entry on the nature of competition in the South African mobile telecommunications market, including Rain Networks as a case study. The research assessed the extent to which Rain Networks had been able to bring about effective competition to the benefit of consumers through lower prices, quality of

service, a wider range of service offerings and/or competition on innovative products. The research proceeded on the findings of the Competition Commission in the (2019, p. 81) which found that price-based competition between the mobile operators was inadequate and that prices of mobile data services had remained static over time despite the introduction of aggressive price reductions of mobile data services by smaller rivals.

Literature tells us that effective competition is concerned with the ability to introduce innovative and effective offerings, and prices that attract customers away from rivals. An analysis of mobile telecommunication markets suggested that competition in these markets took place on price and non-price factors. This research analysed price-based competition by assessing the impact of entry on headline prices of the 1GB and 5GB data-bundle offerings of the mobile operators. The research found no obvious response from competitors on headline prices except for a late response from MTN and Cell C with changes in product offerings that in turn reduced their headline prices. The research found that the reduced prices of both operators still remained much higher than those of Rain Networks on both bundles. These results confirm the findings of the Competition Commission. The findings also indicated that incumbents either do not respond or respond late to the low prices of smaller operators.

The Competition Commission's assessment of the state of competition in the market based on headline prices received a lot of criticism from mobile operators who argued that price competition happened on promotions and not on headline prices (MTN, 2019, p. 29). The operators argued that while headline prices remained unchanged, effective prices of mobile data had fallen significantly. In line with this argument, this research undertook a nuanced approach in analysing the impact of entry on effective prices of mobile data, considering the promotions and discounts offered by the mobile operators on the 1GB and the 5GB data bundles. Due to data constraints, the methodology used in this research to calculate effective prices is basic and differed from that of the Competition Commission which considered both out-of-bundle and in-bundle rates and used data on total revenue, total traffic and volumes purchased as parameters in their calculation. The research found that while there was almost no response from operators on headline prices, an assessment of promotional offerings demonstrates much more vigorous competition among the operators.

Following the entry of Rain Networks, operators began to introduce promotional offerings targeted at specific customer segments. The research showed that effective prices of mobile data for all the operators dropped significantly when these promotions were introduced, even below the price of Rain Networks in some instances. These results indicated that the impact of entry of Rain Networks had been effective in inducing a reaction from competitors and increasing price competition on promotional offerings but less so on headline prices. Whilst the level of price competition between the mobile

operators on promotional offerings is welcome, the research found that the low prices were only beneficial to targeted consumers that were active on those social platforms where promotional discounts were offered and not the broader customer base. The finding was consistent with that of the Competition Commission which found that mobile operators were able to capitalise on the relative inelasticity of certain customers to price changes by targeting those groups of customers that were potential switchers through differentiated and discriminatory offerings. The results of this research imply that mobile operators were able to partition their customers by targeting their promotions and lower prices to those customers that found Rain Networks's offerings attractive and who were likely to switch, while charging high, even maximum prices, to the other groups of customers who had a higher willingness to pay and a lower propensity to switch.

The assessment of market shares showed that Rain Networks was able to attract customers since entering the market, and had, by the end of 2019, grown the share of subscribers to approximately half a million. This was significantly more than what Telkom and Virgin Mobile had achieved in their first three years of operations. The research also showed that Rain Networks had induced customer switching. From about the third quarter of 2018, just one year after its entry, there were significant changes in subscriber shares. The research showed that Vodacom had been able to grow its share of subscribers even in the wake of new competition but MTN's share had declined. These results suggests the operators were not perceived the same by customers and that perhaps Vodacom was more of a premium brand with premium customers while MTN was more mainstream, with customers that were more price sensitive. The analysis of subscriber shares also made an interesting revelation about the relation between MTN and Telkom. The research showed that Telkom shares had grown (from 4% in the second quarter of 2018 to 9% in the third quarter) in the period when MTN's share had declined.

From a non-price perspective, the research revealed that mobile operators also compete on factors such as coverage, quality, reputation, and/or brand awareness. On the assessment of brand awareness and reputation, the research showed that Vodacom and MTN were the biggest spenders on marketing and advertising which were crucial for attracting customers. This was enabled by significant revenues from their wide subscriber bases. Like other smaller operators, Rain Networks's spend on marketing was negligible compared to the incumbents.

The assessment of quality and coverage showed that Rain Networks had surpassed both Cell C and Telkom in the roll-out of 4G and ranked third in the country after incumbents MTN and Vodacom in the provision of 4G coverage in 2018. This finding highlighted the importance of competitive access to network infrastructure for new entrants and smaller operators if they were to effectively compete against incumbents. In addition to the infrastructure, Rain Networks had access to high-demand

spectrum when it entered the market and was able to offer consumers quality network, better speed, and wider coverage at much lower prices compared to its rivals. The delays in spectrum allocation gave Rain Networks a competitive advantage over its rivals and enabled the operator to be the first to roll-out 5G technology in the country, way ahead of industry leaders, Vodacom and MTN.

Literature on competition in mobile telecommunications tells us that competition in this market is challenged by the existence of barriers to entry, network effects, and first-mover advantage. The research showed that as a new entrant, Rain Networks was impacted significantly by switching costs and to a lesser extent by first-mover advantages and network effects. Despite having the lowest offering, Rain Networks was competing against operators that were offering full traditional services while it offered data only services. The research found that typical user of Rain Networks would still need to remain with their operator (either Vodacom, MTN, Cell C or Telkom) for voice and messaging services as Rain Networks did not offer those services. Consequently, customers may be reluctant or just not afford to multi-home or switching between operators. The research showed that incumbents employed strategic actions to persuade customers not to switch, by offering them data services at low prices. While Rain Networks was able to overcome some of these barriers, the research showed that incumbents still enjoyed the benefits of having a large base of users which they were able to retain through targeted offerings thereby depriving the smaller operators of sufficient subscribers to achieve the required economies of scale.

In offering targeted services, Rain Networks, was effective compared to other non-traditional service providers such as MVNO's. The research showed that Rain Networks's standard plan provided customers with a much better offering at competitive prices compared to the promotional offerings of competing mobile operators who offered customers limited services depending on the promotion. For instance, while the WhatsApp bundle only gave consumers access to WhatsApp messaging and excluded other services such as WhatsApp voice or video calling and while other bundles limit customers to specific platforms such as Facebook or YouTube, Rain Networks's customers could access all those platforms as well as other Internet services on the operator's standard plan.

The evidence from this research indicated that Rain Networks's perceived threat was successful in inducing an ability and a willingness among customers to switch and in eliciting a response from competitors in the form of new-product offerings and reduced prices. The research showed that incumbents, MTN and Vodacom, had not responded to the low-price offerings of Cell C and Telkom, suggesting that the incumbents considered these operators as lower-quality providers and not direct

competitors. The response by the incumbents to Rain Networks's low price showed that Rain Networks's service was perceived to be high quality and a closer competitor to both the incumbents. The response of the incumbents was limited to specific segments of customers including WhatsApp users, and social-media and content-streaming users. The findings of the research showed that Rain Networks threatened only a segment of overall consumers and as a result, the incumbents responded only with targeted promotions to retain those customers that were likely to switch. While the research was not able to make an analysis of the proportion of customers that benefitted from the promotions versus those that did not, the fact that overall prices of mobile data remained unchanged suggests that the group of customers targeted through these promotions, although valuable, was not significant enough to force the incumbents to lower overall prices of mobile data.

The findings of this research have important implications for competition policy and regulation. Firstly, theories on barriers to entry suggest that more competition through the entry of new competitors is a viable solution to achieving lower prices and increased product variety if such rivals are effective. The findings of this research showed that the entry of Rain was effective in stimulating competition in the market to the benefit of consumers through lower effective prices, wider product variety, and innovative offerings. The evidence however showed that the effectiveness of Rain Networks was limited to a selected segment of customers and has not resulted in the overall lowering of prices of mobile data across all customers. The Competition Commission (2019, p. 25) identified the lack of access to high-demand spectrum as one of the barriers affecting new entrants. Access to high-end spectrum is crucial in enabling new entrants to provide innovative offerings at competitive prices. With access to quality spectrum, operators can increase the capacity of their networks and provide consumers with quality mobile-data services at competitive prices. The case research of Rain Networks indicated the contrary to a certain extent. The evidence showed that even with access to high-demand spectrum, the impact of Rain Networks was limited and had not reduced the overall prices of mobile data.

The Competition Commission also found that access to competitive roaming and facilities-sharing agreements were crucial elements for the effectiveness of new entrants. Access to network infrastructure is vital in enabling operators to provide sufficient coverage in competition with incumbents. Given the costs associated with building infrastructure, new entrants are not able to roll out their own infrastructure in their initial years and rely on the facilities of incumbents who may have an incentive to raise costs of new entrants or smaller operators by making the costs of leasing infrastructure exorbitant. While there are regulations that regulate access to incumbent's infrastructure, the regulations leave the determination of prices to negotiations between the operators. This leaves new entrants vulnerable to the powerful incumbents who may impose restrictive conditions on access. The research showed that the roaming and facilities-sharing agreement with

Vodacom was crucial in enabling Rain Networks to expand its coverage and roll-out infrastructure even much faster than Cell C and Telkom even though they had been in the market for much longer. However, even with such favourable access, Rain Networks had not been able to effectively drive down overall mobile data prices.

These findings tell us, that competition is multi-dimensional and that mobile operators need a combination of factors including; valuable spectrum, access to an affordable roaming and facilities-sharing arrangement, a strong capital base to enable investment in marketing and infrastructure, and a good reputation to become an effective competitor across the board and not just in targeted segments. The research showed evidence of incumbent advantages that enabled Vodacom and MTN to invest in sunk infrastructure and build brand reputation and awareness through intensive marketing at a scale that the smaller operators were not able to match. Therefore, while the incumbents have all these elements, smaller operators usually have one or two, but seldom have all the elements, which makes it difficult for them to compete effectively against the incumbents.

Secondly, the findings of this research highlight the importance of economic theory in understanding the ability of incumbents to segment customers and build profiles with specific targeted customers. The research showed that mobile operators were able to reduce effective prices of mobile data through targeted promotional offerings. Although the research did not undertake a detailed assessment of the costs of providing data, the fact that they were able to sustain the promotional offerings at lower prices suggested that the offerings were profitable. The ability of mobile operators to drastically reduce prices to as little as R20 per GB through promotional offerings indicated that the mobile operators, particularly MTN and Vodacom, had the ability to further reduce headline prices as recommended by the Competition Commission (2019, p. 126). The findings of this research suggested that headline prices of mobile data had the potential to fall a further 60%, to at least R50 per GB. Although mobile operators submitted that reducing headline prices to effective rates would result in less promotion and consequently reduce competition among operators, the research showed that promotions were targeted and benefitted only a particular group of customers. A reduction in headline prices would achieve much broader positive outcomes across all customers. This assessment is in line with the Competition Commission who argued that while there was competition among mobile operators on promotions, these on their own could not be held as evidence of significant levels of competition in the market, given their limited nature.

The third implication relates to the role of regulation in achieving the desired competitive outcomes for mobile data. The Competition Commission (2019, p. 126) suggested that regulating the market could be the only way to achieve lower data

prices. Opponents of this suggestion argued that regulation would reduce innovation and result in fewer promotional and competitive offerings. The evidence of this research showed that when competition is left in the hands of market participants it would not be able to achieve an overall reduction in prices of mobile data across all customers. The case research of Rain Networks revealed that the incumbents have durable competitive advantages that insulate them from competition. The evidence suggested that regulation and not necessarily increased competition is what was needed to level the playing field and create an operating environment that was conducive for the effectiveness of new entrants. The research showed that headline prices of mobile data remained unvaried despite the lower prices of smaller operators. The stickiness of these prices suggested that regulation could be the only way to force mobile operators to lower headline prices in line with effective rates. The research revealed that incumbents were able to employ complex and discriminatory pricing strategies, as such it would not be enough to regulate standard prices only but such regulations would also need to monitor the technical pricing models of the mobile operators to ensure transparency. Therefore, while there is a need to strike a balance between regulation and allowing for a reasonable return on investments and increased innovation, the case of the South African mobile telecommunications market demonstrated the need for better and coordinated regulation to maximize the benefits that could be derived from competition."

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this research paper.

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