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**The Impact of Entry on Competition in the South African Mobile Data Market: a Case Study on Rain Mobile**

by

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in

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## DECLARATION

I certify that the minor dissertation submitted by me for the degree Master of Commerce (Competition and Economic Regulation) at the University of Johannesburg is my independent work and has not been submitted by me for a degree at another university.

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Rearabetsoe Karabo Motaung



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## ABSTRACT

Mobile telecommunications, and in particular the growth in mobile data consumption, has transformed the way in which consumers and businesses operate and communicate, and has significantly contributed to the growth of the economy through increased productivity effects. Competition in mobile telecommunications markets has become an increasingly important theme as economies strive for more competitive outcomes to maximise the potential for expanded services, lower prices, and increased innovation.

Over the past 19 years, the effective duopoly in the South African mobile telecommunications market, which had long been protected by a strong network effect, was interrupted by the entry of Cell C in 2001, Telkom in 2010, and Rain Mobile in 2017. This research study assessed the impact of entry on the nature of competition in the South African mobile telecommunications market, using Rain Mobile as a case study. Using bi-annual data on mobile data headline prices and promotional offerings from 2016 to 2019, the study 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 Mobile 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 study 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 the study found no obvious response from competitors to the entry of Rain Mobile on headline prices, the assessment on promotional offerings demonstrated much more vigorous competition among the operators through lower prices and product variety. The study also found evidence of competition on non-price factors among operators. The study found that, although the impact of the entry of Rain Mobile 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.

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## LIST OF ACRONYMS

2G	Second-Generation Cellular Network
3G	Third-Generation Cellular Network
4G	Fourth-Generation Cellular Network
5G	Fifth-Generation Cellular Network
DSMI	Data Services Market Inquiry Report
ECA	Electronic Communications Act
GB	Gigabyte
HHI	Herfindahl-Hirschman Index
ICASA	Independent Communications Authority of South Africa
ICT	Information and Communication Technology
ITU	International Telecommunication Union
LTE	Long Term Evolution
LTE-A	Long Term Evolution – Advanced
MNO	Mobile Network Operators
MVNO	Mobile Virtual Network Operators
MTN	Mobile Telephone Network
OECD	Organisation for Economic Co-operation and Development
OTT	Over-the-Top
WBS	Wireless Business Solutions

## Chapter 1

### INTRODUCTION

#### 1.1. Introduction

Telecommunications markets are a major driver of sustainable global economic growth and development as well as consumer welfare and continue to be at the epicentre of innovation and disruption for virtually all other industries (Mutinda, 2016). Telecommunications provide services that are a fundamental driver of productivity gains in the economy and are central to the operation of businesses. Mobile telecommunications, and in particular the growth in mobile-data consumption, has transformed the way in which consumers and businesses operate and communicate, and has significantly contributed to the growth of the economy through increased productivity effects (Global System for Mobile-Communications Association, GSMA, 2012). Competition in mobile telecommunications markets is therefore becoming an increasingly important theme as economies strive for more competitive outcomes to maximise the potential for expanded services, lower prices, and increased innovation (Hauge and Jamison, 2009).

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 in 2010, and more recently Rain Mobile. Today South Africa's mobile telecommunications market comprises five MNOs and alternative mobile data service providers such as MVNOs, giving customers a wide range of mobile service providers to choose from (Hawthorne, Mondliwa, Paremoer, and Robb, 2016). It would not be unusual to expect that the presence of increased competition in the market would drive down the prices of mobile data services.

The case of South Africa presents some controversy as prices of mobile data services seem to have remained static over time, showing no visible response by mobile operators to the increase in competition (Competition Commission, 2019, p. 72). There is therefore a need to understand the impact of entrants and smaller rivals on competitive outcomes. This is even more important in markets such as mobile telecommunications, which are characterised by economies of scale, high entry barriers and first-mover advantages, that make it difficult for smaller and later entrants to attract sufficient consumers necessary to become effective competitors (Hawthorne, *et al.*, 2016).

This research study analysed the impact of the entry and growth of smaller rivals on competition in the South African mobile data market, using Rain Mobile as a case study. Rain Mobile entered the market in 2017 and set out to disrupt the mobile telecommunications market that had long been tightly held by market incumbents, Vodacom and MTN. Rain Mobile was South Africa's first data-only mobile operator and the first to launch 5G network in the country (BusinessTech, 2019a). Rain Mobile entered the market with valuable spectrum, which was compatible with the latest technologies, such as the LTE, at a time when spectrum was very scarce and mobile operators were struggling to meet the high demand for quality data services. Rain Mobile was able to use its high-quality spectrum to offer high-speed 4G and 5G data at very affordable prices compared to its competitors. Rain Mobile was a notable example of how a start-up company could create a threat to large opponents. As a new entrant, Rain Mobile posed an interesting case study about the ability of smaller rivals to compete effectively against incumbents in mobile telecommunications markets, particularly in South Africa. It is important for regulators and policy makers to understand the competitive dynamics of markets as they endeavour to increase competition and reduce prices for the benefit of consumers.

This research study assessed whether incumbents reacted and how they reacted to the entry of new firms into mobile telecommunications markets and if the increase in competition resulted in lower prices. Using bi-annual data on mobile data prices from 2016 to 2019, the research study employed a simple price-comparison methodology of the 1GB and 5GB data bundle plans offered by Vodacom, MTN, Cell C, Telkom, and Rain Mobile. Using headline prices of mobile data packages over time, the study analysed whether prices of mobile data had declined in response to increased competition brought about by new market entrants. Price comparisons over time are commonly used to analyse price competition telecommunications markets (Research ICT Africa, 2019).

Mobile operators are perceived by customers to have differentiated offerings, partly due to the actual features of the services they provide, and partly due to the advertising and track record of the MNOs themselves. This means that differing segments perceive competing offerings differently and can be targeted with differentiated packages and promotional offerings (Competition Commission, 2019, p. 41). Therefore, in markets such as telecommunications, which exhibit dynamic changes in both price and quality of products, promotional discounts are a significant feature and an important factor in the overall prices that customers pay for mobile data. Accordingly, mobile operators vigorously compete on effective prices through promotional offerings (MTN, 2019, p. 29). Using data on free and promotional mobile data offerings, the study took a nuanced approach in determining the effective prices of mobile data

by simply analysing the price per gigabyte that customers pay. The study also analysed the nature of competition between mobile operators on non-price factors such as coverage, quality, reputation, and brand awareness.

Mobile telecommunications markets also have inherent characteristics such as first-mover advantage, network effects, and switching and entry costs, which may hamper the ability of new entrants to effectively compete in the market and attain the desired objectives of effective competition (Hawthorne, *et al.*, 2016). This research study analysed the extent to which Rain Mobile had overcome these entry barriers and had been able to effectively compete in the market given its strategy and quality of service. Understanding the dynamics that hinder the ability of new entrants to effectively compete in the market is important for regulators and policy makers to identify those areas where there may be a need for additional support systems or regulatory interventions that could enable entrants to become effective competitors to larger incumbents.

## **1.2. Problem Statement**

Prices of telecommunications services are a key issue for competition and regulatory authorities. They have a high impact on the whole economy and influence the rate of growth (Roller and Waverman, 2001; Datta and Agarwal, 2004; Waverman, Meschi and Fuss, 2005 and Jeanjean, 2014). Costs of mobile data services in South Africa are perceived by customers to be exorbitantly high and prompted a public campaign under #DataMustFall. The Data Service Market Inquiry (“DSMI”) which was initiated by the Competition Commission in terms of section 43B(2) of the Competition Act No. 89 of 1998 in August 2017, assessed price competition in the market by analysing prices of different data packages offered by mobile operators. In assessing price movements for different packages, the Competition Commission (2019, p. 81) found that price-based competition in the mobile telecommunications market was inadequate despite the introduction of aggressive price reductions of mobile data services by smaller rivals, (Competition Commission, 2019, p. 81). The Competition Commission concluded that the lack of competition signified problems in the market and undermined any efforts by regulators and government to increase competition and enhance consumer welfare. These findings raised significant concerns about the competitive landscape in the South African mobile telecommunications market, and the ability of new entrants and smaller rivals to effectively pose a competitive threat to the large incumbents.

### **1.3. Research Question**

The core research question addressed in this study was the extent to which the South African mobile telecommunications market, specifically the mobile data sector, had become more competitive since the entry of Rain Mobile. The research study also addressed the extent to which Rain Mobile had been able to overcome market barriers to compete effectively, compared to challenger networks, Telkom Mobile and Cell C.

This research study attempted to answer this broad research question by answering the following sub-questions:

- i. What impact did Rain Mobile have on the nature of competition in the mobile telecommunications market?
- ii. Had Rain Mobile been able to effectively compete in the market?

### **Objectives and Significance of the Research**

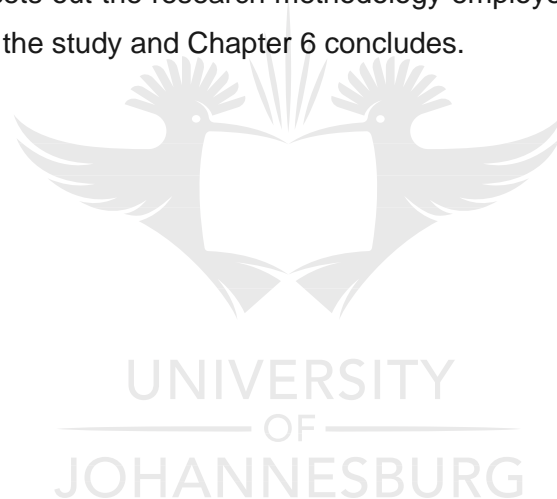
The mobile telecommunications market provides a vehicle for economic growth and participation. The potential benefits of a competitive market environment for stimulating economic efficiency, innovation, greater productivity, and economic growth are widely recognised, because greater competition maximises the potential for lower prices, reductions in costs, expanded services, and increased innovation (Hauge and Jamison, 2009). This research study is a contribution to broader research efforts aimed at understanding the competitiveness of the South African mobile telecommunications market. To the best of my knowledge, this was the first study to incorporate an analysis of promotional offerings in the assessment of price-based competition among mobile operators in the South African mobile telecommunications market.

The key objective of this study was to assess the extent to which Rain Mobile 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, or competition on innovative products. The study achieved this by assessing the reaction of competitors to the entry of Rain Mobile into the mobile data market.

The results of this research study will be beneficial to all stakeholders within the telecommunications sector in South Africa by providing some insights into the competitive

dynamics of the market and demonstrating the importance of new entrants in stimulating competition. Understanding the way rivals compete in the mobile telecommunications market is of importance for consumers because this enables them to make informed choices in terms of tariff plan preferences and / or preferred service providers, based on their different offerings, prices and service quality. Understanding competition dynamics in the mobile telecommunications market is of greater importance to regulators and government because it enables them to ensure that policies are designed to address weaknesses (or failures) within the market, by improving the quality of regulation required to enable new entrants to achieve contestation and competitive outcomes in the market.

The rest of the study is organised as follows: Chapter 2 provides an overview of the evolution of the mobile telecommunications market; Chapter 3 relates this work to existing literature on the nature of competition in mobile telecommunications markets and the impact of entry into this market; Chapter 4 sets out the research methodology employed in this study; Chapter 5 analyses the findings of the study and Chapter 6 concludes.



## Chapter 2

### OVERVIEW OF THE MOBILE TELECOMMUNICATIONS INDUSTRY: A FOCUS ON SOUTH AFRICA

#### 2.1. Introduction

Mobile telecommunications markets represent a large and growing portion of today's economy and provide the basis for the development of a knowledge-centric world (Maicas and Sese, 2011). Mobile telecommunications markets have undergone extensive changes in recent years. Through this evolution, mobile telecommunications markets in many countries, including South Africa, experienced a fundamental change in structure from duopolistic to oligopolistic competition. In this chapter, an overview of the main economic characteristics underpinning mobile telecommunications markets through a critical literature review is provided. In providing an overview of the evolution of mobile telecommunication markets, this chapter considered studies on the South African mobile telecommunications market and the different types of regulations that govern this market.

#### 2.2. Economic Characteristics of the Telecommunications Market

Telecommunications markets in general are governed by key features that have the potential to impact the effectiveness of new entrants and smaller competitors, and ultimately the nature of competition markets. This section provides a broad overview of the economic characteristics of telecommunications markets.

##### 2.2.1. First-mover Advantage

Entry timing is one of the important strategic decisions that entrants must take (Jakopin and Klein, 2012). Being an early entrant in telecommunications markets generally is advantageous for incumbents as they can set themselves up with an established consumer base. Having built a solid consumer base, first-mover advantages enable incumbents to lock-in consumers by making switching costs related to number porting and fixed-contract terms excessively high. First-mover advantages enable early entrants to attract a large fraction of new users entering the market, thereby slowing down the growth in market share of later entrants. Economic studies on this topic have found that first-mover advantage in telecommunications enables incumbents to set prices above competitive levels and thus maximise profits, (Mo and Orazem, 2011; Jakopin and Klein, 2012; Muck and Heimeshoff, 2012, Hoernig, 2008). These



incumbents can grow exponentially during this time and become so big that later entrants find it difficult to catch up and compete effectively against these market leaders.

### **2.2.2. Barriers to Entry**

New entrants in mobile telecommunications markets generally face considerable barriers to entry, some of which are absolute advantages (e.g. cost advantages of dominant enterprises) and others that have been strategically created. Absolute advantages include structural barriers that arise from market conditions that entail high fixed costs of constructing telecommunications network infrastructure, and sunk costs required for attracting customers through advertising, innovative services, or more attractive services (Valaskova, Durica, Kovacova, Gregova and Lazaroiu, 2019). Dominant firms have deep pockets and can invest heavily to further raise these barriers for new entrants. Barriers to entry also result from economies of scale because potential entrants or smaller competitors cannot achieve sufficient scale to reduce average unit costs that would enable them to compete with the incumbents (Competition Commission, 2019, p. 40). Incumbents may strategically want to lock-in consumers by increasing the costs of switching from one operator to another thereby depriving new entrants or smaller operators of sufficient client numbers (i.e. sufficient scale) that are necessary to effectively compete in the market (Mutinda, 2016, Mohamed, Magoro, Giyose and Warren 2012).

### **2.2.3. Network Effects**

In telecommunications markets, consumers derive utility not only from the product or service itself, but also from the networks surrounding these products (Maicas and Sese, 2011). Because of network effects, users benefit from the fact that they are able to communicate with a larger set of other users. If more users join the network, then the installed base of users will be able to communicate with the even more users (Enhan, 2016). Network effects requires that a product or service has a critical mass to be viable. This can affect competition by creating a winner-takes-all market. A firm that has the most users on its network emerges as dominant, to the detriment of new entrants or smaller competitors who have fewer customers on their networks (Jamison, 2012).

## **2.3. The South African Mobile Telecommunications Industry**

In the early 1990s, South Africa witnessed the introduction of mobile telecommunications which was a premium service, offering mobility to voice calls (Theron and Boshoff, 2006). Up until 1993, when mobile telecommunications licences were granted to Vodacom and MTN, the

fixed line operator Telkom was the sole provider of telecommunications services. Both MTN and Vodacom were granted 15-year licences to offer services to the South African market. To further increase competition in the market, a third operator, Cell C, was issued a license in 2001. Telkom launched its own mobile network in 2010, 8ta, which it later rebranded to Telkom Mobile. In June 2006, Virgin Mobile South Africa entered the market as the first Mobile Virtual Network Operator (“MVNO”) in South Africa, operating on Cell C’s network (Theron, 2006). Since then, several other MVNOs (FNB Connect, Standard Bank Mobile, Virgin Mobile SA, MRP Mobile, me&you mobile, Trace Mobile, PSB Network, Smart Mobile, Pink Mobile, Advinne, Viva Mobile, Van Schaik Mobile, Boksel, Xmobile, The Unlimited, OTM Mobile, Lycamobile, and Next Cellular) have entered the market, adding to the competitive mix (McKane, 2018). The South African telecommunications market has remained stubbornly concentrated, with Vodacom and MTN accounting for 71% of the approximately 100-million mobile SIM connections in the country (BusinessTech, 2019b). This despite the presence of challenger networks, Cell C and Telkom. In July 2017, a new competitor, Rain Mobile, backed by businessmen Patrice Motsepe, Paul Harris, and Michael Jordaan, made its debut in the South African telecommunications market as the fifth telecommunications operator.

#### **2.4. The Entry of Rain Mobile**

Rain Mobile was established following the acquisition of Wireless Business Solutions Holdings (WBS) by Multisource Telecoms (Multisource). The transactions were approved by both the Competition Commission and ICASA. Multisource acquired the total shareholding of WBS and through the transaction it inherited radio frequency spectrum in the 1800MHz and 2.6GHzZ bands (Tubbs, 2015). 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 Mobile story is that, unlike the other MNOs (Vodacom, MTN, Cell C and Telkom Mobile), which offer traditional voice, message and data services, Rain Mobile entered the market as a data-only provider, providing an LTE-A mobile network designed to meet the growing demand of South African consumers (Bell and Bosiu, 2019).

In 2019, with access to high-frequency spectrum, Rain Mobile was the first South African operator to launch 5G network. Rain Mobile 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 has placed Rain Mobile ahead of market incumbents, MTN and Vodacom, at a time when South Africa’s vision is, by 2030, to ensure a seamless information

infrastructure for an inclusive knowledge economy. Since its entry, Rain Mobile has been making inroads into the mobile telecommunications market. The operator has penetrated the telecommunications market as a non-traditional entrant with a unique and competitive offering (Bell and Bosiu, 2019).

## **2.5. Regulatory Framework of the South African Telecommunications Industry**

With the evolution of telecommunications industries across the world, there has been an increase in competition, as new players enter the market. According to Irvine and Granville (2009), the benefits of increasing competition in this industry are enormous, given the pervasive impact of telecommunications on the competitiveness of all firms and sectors. 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. Network infrastructures are expensive to duplicate and can create structural entry barriers, giving incumbent operators access to a large share of the network infrastructure necessary for providing downstream services (Fourie, Granville and Theron, 2015). By definition, regulations which govern facilities are required to facilitate market entry. Given their oligopolistic structure and concentrated nature, telecommunications markets lend themselves to abuse by a dominant firm, so regulations that foster competition and punish anti-competitive conduct in the industry are also vital (Irvine and Granville, 2009).

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. 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 the an adjudicative body over competition matters and the Competition Appeal Court which considers appeals from or reviews for decisions of the Competition Tribunal. This shared responsibility of the two regulators, ICASA and the Competition Commission, is provided for by section 4(3A)(b) of the ICASA Act and by section 21(1)(h) read with sections 3(1A)(b) and 82(1) and (2) of the Competition Act. The relationship between ICASA and the Competition Commission is governed by a Memorandum of Agreement, which sets out the way the parties will interact with each other in respect of the investigation, evaluation and analysis of mergers and acquisitions transactions, and complaints involving telecommunications and broadcasting matters (Government Gazette,

2019: 4). The Agreement sets out the procedures to be adopted by both regulators in investigating matters falling within the ambit of the Agreement.

### **2.5.1. Competition Policy**

The primary objective of competition policy is to maintain and protect effective competition. 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. The Competition Commission is responsible for 'ex post' regulation which refers to implicit market intervention and entails detecting, investigating, and remedying anti-competitive behaviour (Fourie *et al.*, 2015). Competition policy enables competitive markets 'ex post' by investigating alleged anti-competitive behaviour and evaluating merger activity. The purpose of creating competition regulations is to guard against restrictions and impediments to competitions that are unlikely to be naturally corrected by competitive forces.

### **2.5.2. Sector-Specific Regulation**

Unlike competition policy, the objectives of sector-specific regulation are generally much broader and more complex because they also encompass other objectives such as technical standards and consumer protection. Although some of the objectives of regulation may be outside the jurisdiction of competition policy, often they are complementary to competition policy in creating and maintaining competitive markets (Centre for Competition, Investment & Economic Regulation, 2003). In South Africa, ICASA is responsible for implementing and enforcing 'ex ante' regulation, which refers to explicit market intervention by the regulator 'before the fact'. This implies regulation that is put in place to establish conditions within the industry to ensure that the market functions optimally (Fourie *et al.*, 2015). As an Economic Regulator, 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 (Hawthorne, 2014).

## **2.6. Regulation of Mobile Telecommunications Services in South Africa**

The evolution of South Africa's mobile telecommunications market has been defined by three key dynamics: the regulatory framework, technology evolution, and the competitive

environment. The introduction of competition in an industry characterised by first-mover advantages may result in abuse of dominance by incumbent firms to undermine competition from new entrants. There are three main areas in mobile telecommunications that are regulated in South Africa for purposes of creating an environment that is conducive to competition, and to prevent incumbents from abusing their power in the market to the detriment of new entrants and smaller competitors. These include spectrum, interconnection and facilities leasing (Hawthorne, 2014).

### **2.6.1. Radio Frequency Spectrum Regulation**

A spectrum licence is required in addition to a service licence to enter the mobile telecommunications market. In South Africa, licences to provide mobile services were initially provided exclusively to MTN and Vodacom. According to Hawthorne (2014), this significantly limited the number of new entrants into the market until 2001. The regulation of spectrum assignment and licencing, which is enshrined in Chapter 5 of the ECA, seeks to ensure that spectrum is made available to users who value it most (Government Gazette, 2015, p. 3). The traditional management of spectrum created artificial spectrum scarcity resulting in the exclusion of new entrants from the market. Technological advancements have increased the demand for spectrum more than the supply, which has forced regulators to consider market-based allocation methods such as auctions, trading, and leasing of spectrum (Kedama, 2014). The regulations have enabled new entrants to get access to spectrum. This has opened the market, creating competition.

### **2.6.2. Interconnection Regulation**

One of the key features of telecommunications markets is network effects. Where networks are incompatible (where there is no interconnection), consumers may fail to co-ordinate their decisions thereby impeding the entry of new, more efficient entrants, even where these new entrants have lower costs. The interconnection regulations are in place to ensure that incumbents are not able to benefit from network effects at the consequent exclusion of rivals. Interconnection regulations are enshrined in Chapter 7 of the ECA and they oblige all licensees to interconnect with other duly licenced entities on request, when it is technically and economically reasonable (Government Gazette, 2010a, p. 3). The regulations strive to prevent incumbent firms with market power from strategically denying competitors access to customers on their networks by making it too costly.

### **2.6.3. Facilities Leasing Regulation**

To operate as an MNO, business need access to infrastructure. Obtaining rights of wayleave to trench and deploy infrastructure is often difficult and time consuming. This is particularly concerning for new entrants who need access to infrastructure to offer their services. To address these barriers to entry, the ECA has implemented facilities leasing regulations. These are governed in terms of Chapter 8 of the ECA (Government Gazette, 2010b, p. 3) and oblige licensees with significant market power to lease and provide electronic communications facilities, when requested and if technically and economically viable. The regulations are designed to ensure that new entrants can gain access to facilities to climb the 'ladder of investment. Facility leasing regulations provide for the sharing of fibre cables, base stations and other critical telecommunications infrastructure, which are especially important in increasing competition and efficiency across the industry. The regulations are intended to allow smaller operators to lease facilities from incumbent operators while they build up their own networks (Cave, 2004 in Hawthorne, 2014).



## Chapter 3

### LITERATURE REVIEW

#### 3.1. Introduction

This research study drew from different bodies of literature. Firstly, it drew from literature on the nature of competition in mobile telecommunications markets. More specifically, the study drew from literature that was largely focused on the dynamics of mobile telecommunications markets and factors that affected competition in these markets. Economic theories on the effects of competition on prices suggest that prices decline with an increase in competition (Singh and Zhu, 2008; Beckert and Mazzarotto, 2010; Seim and Viard, 2011). This body of literature indicated that competition in mobile telecommunications markets increased product variety and brought about price competition to the benefit of consumers.

Secondly, the study drew from literature on the impact of entry of new competitors in mobile telecommunications markets. Researchers in this field have found that the timing of entry is particularly important for new entrants and, ultimately, on their ability to compete effectively (Xiao and Orazem, 2011; Jakopin and Klein, 2012; Muck and Heimeshoff, 2012). These studies found that first-mover advantages benefitted early entrants as they could build up market share and grow substantially in the period when there were no competitors.

#### 3.2. The Nature of Competition in Mobile Telecommunications Markets

Competition is the most efficient mechanism for organising, operating, and disciplining economic markets and distributing resources efficiently, while maximising societal benefits through allocative efficiency, productive efficiency, and dynamic efficiency. There is thus a growing recognition of the importance of competition for the success of market economies and the need to both maintain competition and to regulate industries where competition remains limited (Stiglitz, 1999). 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 strong network effects, large sunk costs of essential facilities, brand recognition and loyalty, and the legacy of public monopolies that provide incumbents with economies of scale, established networks, large subscriber base, deep pockets, and market experience (Hawthorne, *et al.*, 2016).

Studies by Genakos, Valletti and Verboven (2017) and Valaskova, Durica, Kovacova, Gregova and Lazaroiu (2019) have shown that market concentration is an important indicator of a market's performance. In particular, the measuring of market concentration is recognised as an appropriate starting point for assessing the intensity of competition in the market (Valaskova, Durica, Kovacova, Gregova and Lazaroiu, 2019). Regulatory authorities in telecommunications are particularly concerned about the levels of concentration in the market and how these impact on prices of telecommunications services. This concern stems from economic theories that suggest that prices decline as competition increases, while highly concentrated markets typically result in higher prices for consumers.

Genakos, Valletti and Verboven (2017) studied the dual relationship between market structure and price, and between market structure and investment in the mobile telecommunications markets of thirty-three OECD countries. They found that on average a 10-percent increase in the Herfindahl-Hirschman Index (HHI) increased mobile prices by 20 percent. They also found that an increase in market concentration resulting from a merger that reduced the number of operators from four to three, increased mobile price by 16 percent compared to when there was no merger. The findings of the study revealed that highly concentrated markets with little competition lead to higher end-user prices. These findings confirm the notion of economic theory suggesting that competitive markets result in reduced prices and increased consumer welfare. Competition promotes economic efficiency, assuring that costs are minimised and that resources are allocated efficiently and optimally. When markets are competitive, firms are compelled to find innovative ways to improve quality of products and services in ways that continually attract consumers. Jeanjean (2013) found that after investment, the impact of competitiveness in markets was one of the main drivers of unit-price reduction. Grzybowski, Nicolle and Zulehner (2017) also found that low-cost tariffs declined because of increased competition in the French market.

The dynamics of competition in mobile telecommunications are however influenced by the existence of barriers to entry, network effects, and first-mover advantage. Telecommunications markets exhibit some inherent characteristics that lend the market to high barriers to entry (Hawthorne, *et al.*, 2016). The barrier-to-entry feature of these 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.* (2016) 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 could limit the ability of new operators to enter the market and compete. Their study showed that delays in the



finalisation and / or effective implementation of regulations regarding Local Loop Unbundling, facilities leasing, and spectrum allocation in the South African market had not only delayed plans of firms to roll-out broadband but had made it more costly (and less efficient) because of the lack of access to appropriate spectrum, and the need to duplicate infrastructure and other facilities that, ideally, should be shared.

New entrants into telecommunications markets also encounter other obstacles that make entry difficult. The studies of Roberts (2016) and Xiao and Orazem (2011) highlighted the importance of sunk costs to new entrants. Building on the Bresnahan and Reiss methodology, Xiao and Orazem (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. According to this research, new entrants, who incurred sunk costs to enter a market, would only enter when the market size had grown enough to cover their entry costs. Their study revealed that a first entrant, who had monopoly power to charge high prices, could recover entry costs even with a relatively low number of subscribers. The study highlighted the importance of sunk costs in determining entry conditions. It showed that high entry costs constrain entry and delay stabilisation of new entrants and their ability to timeously recover their return on investment. Xiao, and Orazem (2011) showed that when there were no sunk costs, entry conditions varied for a fourth entrant. They also found that sunk costs of entry were lower for earlier rather than later entrants, making entry conditions for the fourth and later entrants more difficult.

Mobile telecommunications markets are also a paradigmatic example of an industry where network effects and switching costs drive market competition (Maicas and Sese, 2011). Switching costs and network effects have traditionally been considered important sources of market imperfections because of their subsequent effect on firm behaviour. Theoretical models predict that one of the main risks in markets that exhibit these two elements is that they enable firms to design their strategies with the aim of benefiting from these failures and gaining abnormal returns (Fuentelsaz, Maicas and Polo, 2010). 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. Theoretically and empirically, research in this area has argued that network effects may confer some market power that firms can strategically exploit to reduce competition and thus increase profits. For instance, Fuentelsaz *et al.* (2010) analysed how switching costs and network effects separately influence prices and competition in the European mobile telecommunications market. Their results 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 users' choice of mobile service

providers in the UK. They found that there were direct network effects even in the absence of price differences between on-net and off-net calls, and that individual choice was heavily influenced by the choices made in the individual's social network.

Network effects have significant implications for the way in which markets operate and firms compete. They drive market competition and consumer behaviour and are therefore a central strategic asset for assessing the nature of competition in such markets. Markets that exhibit network effects may result in winner-takes-all outcomes to the detriment of smaller competitors and potential new entrants (Maicas and Sese, 2011).

The results of these studies have important implications for policy. The results indicate that introducing competition in the early stages of the industry may overcome the undesirable consequences of network effects. Similarly, if one operator is alone in the market for a long time, it has more opportunities to generate switching costs in its customer base. Both these points speak to the importance of timing between entry of the first and later operators and emphasises that introducing competition from the beginning ensures that all operators experience the same conditions when the market starts to grow, minimising market failures.

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.*, 2016). 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 lower than for later entrants, enabling both first movers and incumbents in the telecommunications market to be more successful (Xiao and Orazem, 2011; Jakopin and Klein, 2012; Muck and Heimeshoff, 2012). In a separate study, Fernandez (2017) 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. Late entrants needed time to build a reliable network and this created coverage differences that put them at a disadvantage. Incumbents may also have control over scarce resources and are more likely to exercise strategic actions aimed at preventing entry of new entrants or inhibiting expansion of smaller competitors.

First-mover advantages are also associated with the recognition of brand loyalty. An empirical study of the German market showed that brand-loyalty in the mobile industry was associated with customer satisfaction of service quality. The study revealed that satisfied clients are less

likely to change providers, even when entrants offered lower prices and good services (Gerpott, Rams and Schindler, 2001 in Fernandez, 2017). In another study looking at market penetration and late entry, Hoering (2008) found that tariff-mediated network effects were always to the detriment of later entrants and that these network effects mattered for long-run market shares, particularly when there were locked-in consumers of the incumbent, at the entry date. The study showed that large differences in entry dates left incumbent networks with high numbers of locked-in consumers.

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, and thus an increase in mobile penetration, particularly for low-income consumers, the latter competitors have not been able to significantly constrain the market incumbents, MTN and Vodacom. The findings of these studies call for policy measures that foster the growth of entrants (Izak and Pinar, 2007). These studies highlight the importance of creating an enabling environment by ensuring that those who enter the market find adequate conditions to operate and compete against incumbents (Fernandez, 2017).

Understanding these dynamics is important for policy makers and regulatory authorities who need to understand the asymmetries among competitors in order to develop reforms that are aimed at levelling the playing field between operators. Studies on the impact of first-mover advantage on the successful entry and expansion of new entrants highlighted the important role of asymmetric price regulation in ensuring that entrants could compete effectively and exert enough pressure on prices, to the benefit of consumers (De Bijl and Peitz, 2002).

### **3.3. The Impact of Entry into Mobile Telecommunications Markets**

Literature on competitive dynamics indicates that incumbents' strategic responses to entrants can take different forms. Bain (1956) in Schoeffler (1957) suggested that incumbents could

accommodate entry if structural barriers were low, entry-detering strategies were ineffective, or the costs to the incumbent of attempting to deter entry, outweighed the benefits of keeping the entrant out of the industry. Ravi & Hadjinicola (1996) suggested that incumbents' strategic response to entry could also take the form of product repositioning. They submitted that incumbents could chose to differentiate themselves after entry occurs to avoid price competition, especially in industries with low barriers to entry.

Theoretical models of imperfect competition make various predictions about the competitive effects of market entry. They suggest that firms with market power may exploit their position to reduce quality, just as they may raise prices. In most models, the entry of new competitors leads to price reductions by putting more competitive pressure on market incumbents (Tirole, 1988 in Bresnahan and Reiss, 1991). The entry of a new competitor in a market has repeatedly been identified as one of the important determinants of a market's structure and profitability. 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. In an evolving market, because of its own unique marketing and positioning strategies, the addition of a new competitor may expand total market volume, as market entry is usually accompanied by increases in product variety, promotional activity, and distribution. These changes may attract new buyers and lead to accelerated market growth and expansion.

The predictions of these models are particularly important in telecommunications markets where there are considerable debates regarding the relationship between market structure (i.e., the number of operators in the market), market performance, and where regulatory authorities are concerned about the impact of entry on prices of telecommunications services. In mobile telecommunications specifically, it has been argued that competition from new entrants brings about a huge impact in terms of different business models, creating additional incentives to reduce costs, the availability of new products in differentiated markets, and intensified price competition (Laffont and Tirole, 2000 in Gruber and Verboven, 2001, Roberts, 2016).

Economists agree that there are substantial consumer gains that can result from entry of new competitors in a market. 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. They found that the consumer

welfare gains from the increased viability likely exceeded their estimated welfare gains derived from both increased product variety and increased price competition. Their findings were supported by Seim and Viard (2011) who found that entry induced firms to increase and enhance their offerings. Their results revealed that firms responded directly to new competition through competitive interaction and indirectly by accelerating the introduction of new services and discontinuing old ones. Thus, while a fall in price remained the obvious desired outcome of competition, research showed that incumbents often did not respond to competition by immediately reducing their prices but considered other ways in which to respond to potential or actual competition.

Besides variety and price effects, Bourreau, Sun and Verboven (2017) found that consumer welfare could be further enhanced by the introduction of subsidiary brands by incumbents. Assessing the case of the French mobile telecommunications market, they found that firms reacted to competition of new entrants by introducing fighting (subsidiary) brands as a competitive strategy to capture the rents from a low-cost entrant in a segment of the market which they previously had no interest in serving. Their study showed that a new entry incentivised incumbents to introduce fighting brands at the expense of moderate profit losses. In a separate study, Majumdar (2010) evaluated the impact of competitor entry on efficiency outcomes in two-sided network markets focusing on the incumbent firms making up the local exchange segment of the telecommunications industry in the US, over a fourteen (14) year period from 1988 to 2001. The study showed that encouraging the entry of competitors had led quite substantially to the enhancement of efficiencies for the incumbent firms. The study further showed that markets characterised by more competition, with more players, more dynamic entry and exit, and more intense rivalry for customers, tended to deliver better market outcomes.

Similarly, in a study assessing the performance of mobile phone services across Bangladesh, Ghana, Kenya, Vietnam and Zambia, Ellis and Singh (2010) found that the introduction of competition in the mobile markets, in each case-study country, drove the rollout of services, increased market penetration, and reduced prices. Their research showed that a competitive environment strengthened incentives to design services to meet the needs of customers, including price and product promotions for poor customers, and value-added services with additional development benefits, such as money transfer services.

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 Orazem, 2011). Bresnahan and Reiss (1991) study the impact of entry in five different retail and professional industries and found that competitive conduct changed quickly as market size and the number of incumbents increased. Their study 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 are consistent with those of Xiao and Orazem (2011) who assessed the impact of entry of the fourth entrant in the US broadband market. They found that the entry conditions become increasingly more difficult for the fourth and subsequent entrants, implying that new entrants beyond the first three firms had little effect on competitive conduct in the market.

Houngbonon (2015) made similar findings in a study that assessed the impact of entry and merger on prices of mobile telecommunications services. The results of this study indicated that entry of the fourth mobile operator raised the unit price of mobile data plans, in contrast to the merger from four to three operators, which reduced the unit price of mobile data plans. Genakos *et al.* (2017) however made contradictory findings in their study. They found that the fall in mobile prices was larger (15,9 percent) when entry occurred in a market with four operators compared to 8,6 percent when entry occurred in a market with three or fewer operators. The results suggested that as more entrants enter the market, the ability of new entrants to charge higher prices diminished relative to the incumbents.

The inconsistent results of studies on the impacts of entry on market 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 study which sought to assess whether the entry of a fifth competitor resulted in effective competitive outcomes in the South African mobile telecommunications market.

## Chapter 4

### RESEARCH METHODOLOGY

#### 4.1. Introduction

In this chapter, the research methodology applied to assess the extent to which the South African mobile telecommunications market had become more competitive since the entry of Rain Mobile and the extent to which Rain Mobile had been able to overcome market barriers to compete effectively is discussed. The research design, research methodology, and the data collection that were applied in this research study are presented.

#### 4.2. Research Design

The empirical test of this research study entailed an analysis of the impact of the entry on competition in the mobile telecommunications market, using Rain Mobile as a case study in South Africa. This research study made use of mixed methods to analyse the impact of entry and to assess the nature of competition in the South African mobile telecommunications market.

Firstly, this research study employed a simple price-comparison methodology to analyse how prices of mobile data have changed over time. The price comparison involved an analysis of the headline prices for the 1GB and 5GB mobile-data packages offered by each of the mobile operators; Vodacom, MTN, Telkom, Cell C and Rain Mobile. An analysis of prices over time would inform us about the nature of competition on headline prices in the market. Furthermore, analysing the developments in the prices of mobile data, before and after the entry of Rain Mobile, enabled us to determine the impact of entry on competition and on prices in the mobile telecommunications market.

Opponents of this assertion have argued that competition in the mobile telecommunications market does not happen on headline prices but rather through aggressive promotional offerings and other non-price factors. Accordingly, the opposition argued that while there had not been notable changes in headline prices over time, effective prices had declined significantly in response to increased competition in the mobile telecommunications market (Competition Commission, 2019, p. 84).

This research study analysed the impact of promotional offerings on price competition in the market. The study assessed how these promotional offerings had changed over time and how mobile operators used the promotional offerings to target different customer segments. This analysis would inform us about the nature of competition on promotional offerings in the market and enable us to determine the impact of the entry of Rain Mobile on the competitive strategies of rivals. In addition, the research study took a nuanced approach in determining the effective prices of mobile data services, considering the promotional offerings over time. This assessment would inform us about the extent of competition in the market and whether such competition translated into lower prices for customers.

Secondly, in understanding that mobile telecommunications services are not homogenous and customers' choices of operators are not simply based on price of the services offered, this research employed a non-price comparison methodology to assess how mobile operators competed on factors such as quality, coverage, reputation, and brand awareness and the impact of these factors on the ability of mobile operators to compete effectively.

## **Research Methodology**

### **4.2.1. Comparison of Headline Prices of Mobile Data Services**

Price comparison methodologies are particularly useful in the analysis of price competition in telecommunications markets. Through comparisons, researchers can conduct analyses of market trends, assess competition of product offerings, and assess the impact of competition on prices. This research study employed a simple comparison of headline prices of the mobile operators to assess the prices paid by customers for mobile data services, and how these had changed over time. The price comparison methodology used in this research followed the ITU ICT Price Basket methodology, which has been developed to compare and measure mobile data prices, taking into consideration the number of megabytes provided and the validity period of the products (International Telecommunication Union, 2014).

Mobile operators offer data bundles in various sizes starting from 100MB to 20GB. The research study compared headline prices of mobile operators Vodacom, MTN, Telkom, Cell C and Rain Mobile for the 1GB and 5GB data bundles. The motivation to focus only on these two bundles stemmed from the fact that these were the only data-bundle sizes offered by Rain Mobile and the only products for Rain Mobile competes. Mobile operators also offered customers different purchase plans including mainly post-paid and prepaid. Rain Mobile's products are only available on a prepaid plan and thus the operator does not compete for



customers in the post-paid market. The research therefore analysed headline prices for the 1GB and 5GB data bundles offered on the prepaid purchase plan.

Mobile operators offer differentiated product plans to enhance the value the consumer derives from their data consumption. It is therefore common to find that some operators do not offer a 1GB data bundle but rather an 800MB or a 1.2GB. Similarly, operators could offer a 4.5GB or a 6.4GB instead of a 5GB bundle. For instance, in 2018 and 2019 MTN and Cell C, respectively, discontinued their 1GB package and both replaced it with a 1.5GB package. Similarly, both MTN and Cell replaced their 5GB bundles with 6GB and 6.6GB, respectively. To apply the ITU ICT Price Basket methodology, the plan selected should not be less than 1GB or 5GB but can be more. For instance, if an operator offers a 550MB and a 1.2GB plan, the cheapest between the 1.2GB bundle or two 550MB bundles should be selected for the 1GB basket. Similarly, if an operator offers 2.5GB and 6GB data bundles, the cheapest between the 6GB or two 2.5GB plans would be selected for the 5GB basket (Research ICT Africa, 2019). Mobile operators also offer data bundles with varying validity periods to meet the customer's needs. These can be hourly, daily, weekly, or monthly. The ITU ICT Price Basket methodology proposes plans with a validity period of 30 days or four weeks. Therefore, when using this method, a plan with a 15-day validity period for instance, would be selected twice to meet the basket criteria. Similarly, a plan with a validity of one day or one week should be taken as many times as needed to cover the 30-day or 4-week validity period. Once again, the cheapest plan based on the validity period between the one day or one week should be selected.

#### **4.2.2. Analysing the Effective Prices of Mobile Data Services**

Usage of data better characterises the amount of useful service for consumers (Jeanjean, 2014). It is therefore more appropriate to consider the price of a unit of consumption rather than simply comparing headline prices which do not consider promotional discounts offered by operators. The research study analysed the different promotional offerings of the mobile operators to assess the nature of competition between the operators. The study assessed how these had changed over time and whether the entry of Rain Mobile had any effect on the nature and extent of promotional offerings.

In line with the ITU ICT Price Basket methodology explained above, this research study analysed promotional discounts offered by the mobile operators on the 1GB and 5GB data bundle plans over the sample period. The research considered only promotional offerings with

a validity period of one month or 30 days and made the necessary adjustment to promotional offerings with shorter validity periods, to meet the 30-day criteria.

The research study also took a nuanced approach in calculating the effective price paid by customers per gigabyte for each of the promotional offerings that were assessed. This analysis sought to inform us about the nature of competition in the market and how competitors used different promotions to target different customer segments.

#### **4.2.3. Analysing Competition on Non-Price Factors**

Providing extensive network coverage, quality services, and maintaining high performance and brand reputation are all essential tools of competitive differentiation in mobile telecommunications markets and represent the non-price factors against which mobile operators compete. This research study assessed the extent to which mobile operators competed against one another on coverage, quality, performance, and brand awareness. The research analysed how issues of infrastructure and spectrum affected the ability of operators to effectively compete on these non-price factors.

#### **4.2.4. Assessing the Effectiveness of Rain Mobile**

Barriers to entry in telecommunications markets include first-mover advantages, costs of entry, network infrastructure, network effects, and switching costs. In assessing the effectiveness of Rain Mobile as a competitor in the market, this research study firstly assessed the extent to which Rain Mobile had been able to overcome these barriers. The study assessed the extent to which Rain Mobile had, since its entry in 2017, been able to access customers and grow its subscriber share. Secondly, this study analysed the impact of Rain Mobile on the performance of its competitors by analysing the switching patterns of customers and how these had affected rivals' revenues from data services.

### **4.3. Data Description**

This research study used bi-annual mobile data prices of all the mobile operators over the period 2016 to 2019 to undertake the assessments. The period selected took into consideration the fact that Rain Mobile only entered the market in 2017 and for purposes of assessing the impact of the entry of Rain Mobile on competition in the market, the study considered 2016 as the period before its entry and 2017 to 2019 as the period after entry. The data consists of prepaid mobile data prices for the 1GB and 5GB data plans. The data also

consists of information on promotions and discounts offered by the operators on the 1GB and 5GB data plans during the period of study.

#### **4.4. Data Collection Methods**

Economic theories on competition suggest that prices reflect the nature of competition in the market (Singh and Zhu, 2008; Beckert and Mazzarotto, 2010; Seim and Viard, 2011). This study used quantitative data obtained from tariff-notification reports submitted bi-annually to ICASA by each of the mobile operators. The reports are compiled by ICASA and contain information on prices of mobile data services, notifications on price changes, promotional offerings and discounts by the mobile operators in the specific reporting periods. The reports are publicly available on the ICASA website.

The study also collected quantitative information from various sources including annual financial reports of the mobile operators, industry reports, desktop searches and interviews to analyse the impact of entry on subscriber shares, customer switching patterns, and data revenues of the mobile operators. The interviews were undertaken with the following market participants: Rain Mobile, MTN, Cell C and Telkom. This sample is justified by the fact these are the main mobile operators in the market. Vodacom did not participate in the interviews. The interviews were conducted telephonically and via Microsoft Teams online platform. The information collected from the market participants was critically analysed and used to assess the nature of competition in the market, the competitive strategies of the mobile operators, and the impact of Rain Mobile's entry on competition in the market.

The interview questions for MTN, Cell C and Telkom were arranged in the following format:

##### **A- Company Information**

The questions focused on the background of the business of the mobile operators and more particularly on their service offerings and main areas of revenue.

##### **B- Customer Segments**

The questions focused on the profiles of customers, their preferences for different products, and how these have changed over time. The questions also focused on the sensitivities of different customer segments to prices of mobile data, quality of service, and reputation of service provider.

### **C- Information on Infrastructure: Spectrum and Sites**

The questions focused on the nature and quality of the spectrum allocated to the operators and the implications of these on the products the operators offer or could offer. The questions also focused on the implications of the costs and availability of spectrum on the products the operators offer or could offer. With regards to sites, the questions focused on the number of sites utilised by the mobile operators, whether these were owned or leased, and the associated costs and details of leasing agreements. The questions also focused on decisions around on the location of the sites and the implications of these on the ability of the mobile operators to provide data services.

### **D- Promotional Offerings**

The questions focused on the different types of promotions offered by the operators and the effectiveness of promotions as a competitive strategy to attract new customers and retain existing ones. The questions also focused on the importance of marketing for each of the operators and how the marketing of promotions contributed to their brand reputation.

### **E- Nature of Competition**

The questions focused on the views of the operators on the nature of competition in the market and how this has changed over time, particularly in respect of prices of mobile data services, product offerings, promotions, and discounts. The questions also focused on the impact of entry of new rivals on the nature of competition, the challenges facing new entrants and small MNOs in the market, and the challenges of operating as a mobile operator in South Africa.

In addition to the above, interview questions for Rain Mobile included the following:

### **F- Entry Requirements**

The questions focused on the nature of the regulatory requirements imposed on new entrants in mobile telecommunications markets and the impact of such requirements on the time and costs of entry. The questions also focused on Rain Mobile's experience of entry into the market in terms of challenges, competitors' responses, and overcoming entry barriers.

In addition to the above, other sources of data used in this research study include desktop research, research articles, industry reports, and annual financial reports of the mobile operators.

#### **4.5. Limitations of the Study**

While the proposed research aspired to be a comprehensive assessment of the mobile data market, it acknowledged that not all questions related to the competitiveness of the mobile data market were answered in the context of this research study. There were inherent limitations which affected the completeness of the results and the depth of the research.

Firstly, the data used in this research was limited to a short period, from 2016 to 2019. This was due to unavailability of data on mobile data prices or promotions and discounts prior to 2016.

Secondly, the data used in the study consist of bi-annual information on headline prices and promotional offerings and therefore did not provide much variation over the time. This was also exacerbated by the unavailability of data prior to 2016.

Thirdly, the research study undertook a nuanced approach in calculating the effective price, using only information that was publicly available. Customers could be receiving even more discounts on their data purchases based on, for example their consumption patterns or the platform from which make their purchases (e.g. do they purchase data via their banking app or through the mobile operators' app), which would further drive down the effective price per gigabyte that customers could pay. This pricing information is commercially sensitive and was not publicly available, and therefore could not be used in this study.

Fourthly, understanding the responsiveness of customers to the promotions would have enabled this research study to assess the extent of the benefit to consumers who took up these targeted promotions. However, data on the uptake of these promotions is commercially sensitive and not available publicly.

Lastly, while MTN, Vodacom and Telkom publish their financial results, Cell C and Rain Mobile did not. Due to limited information on these operators, the research study made use of approximate figures where necessary.

## Chapter 5

### ASSESSING THE IMPACT OF RAIN MOBILE ON THE NATURE AND EFFECTIVENESS OF COMPETITION IN THE MARKET

#### 5.1. Introduction

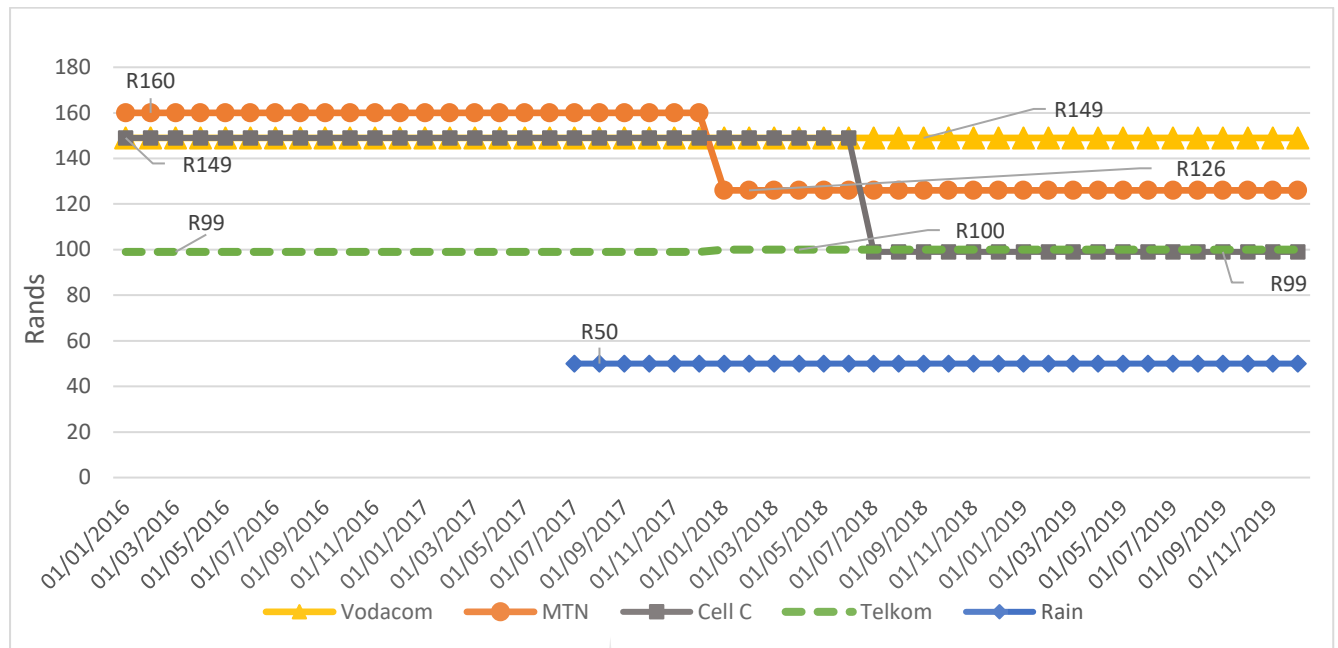
The data on price and non-price competition in mobile data used to assess the impact of the entry and growth of Rain Mobile is analysed in this chapter. It highlighted the importance of considering prices in terms of promotions, while recognising that these enabled firms to target segments of consumers and limited the effects of competition. The competition on non-price aspects including quality, coverage, reputation, and brand awareness were also assessed in this chapter. All the data constraints were noted for the purposes of this assessment.

#### 5.2. 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). One of the critical questions in telecommunication markets is the extent to which operators compete with one another. 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 (Genakos *et al.*, 2017), 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 2016 and 2017, with some changes in 2018.

**Figure 1: Headline Prices of the 1GB data bundle - 2016 to 2019**



Source: ICASA Tariff Reports

Until July 2017, when Rain Mobile 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 Mobile entered the market in mid-2017 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 Mobile, 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 Mobile, 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 Mobile’s entry with lower prices but had not responded to prices set by Telkom, suggested that the operators did consider Rain Mobile’s

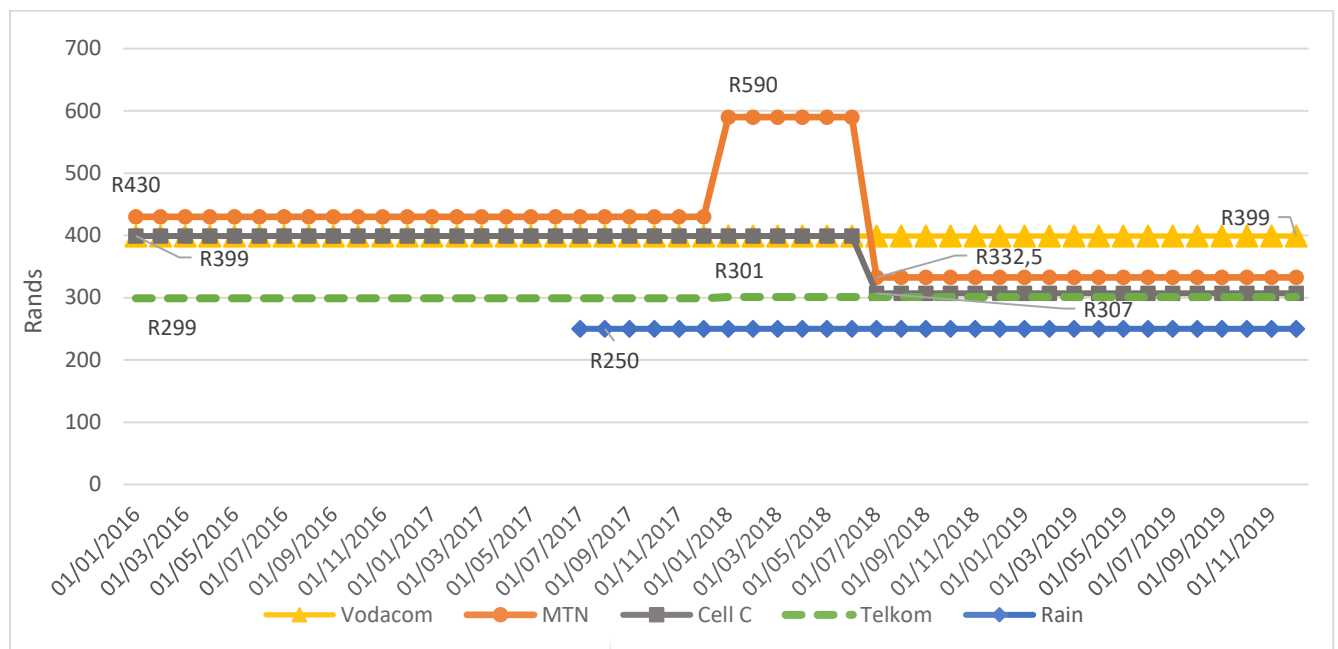
offering to be of higher-quality and perhaps a credible threat which could attract customers away from them. In 2018, MTN discontinued the “loss generating” 1GB offering (MTN, 2019, p. 25). The fact that Vodacom did not react to Rain Mobile’s lower prices suggested that Vodacom did not see Rain Mobile 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 Mobile’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 Mobile’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 2016 and 2017 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 2017, Rain Mobile 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: Headline Prices of the 5GB data bundle - 2016 to 2019**



Source: ICASA Tariff Reports

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 Mobile’s credibility as a competitor. However, unlike in the 1GB market, the price differentials between Rain Mobile’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 Mobile’s offerings were attractive to this segment of consumers who were high-end users of mobile data, and, consequently, Rain Mobile was posing a greater competitive constraint in the 5GB market and attracting customers away from the other operators.

While there had been some competitive responses by the 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 (Appendix A) 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 (Appendix A)

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 (Appendix A).

### ***Promotional offerings for mobile-data services***

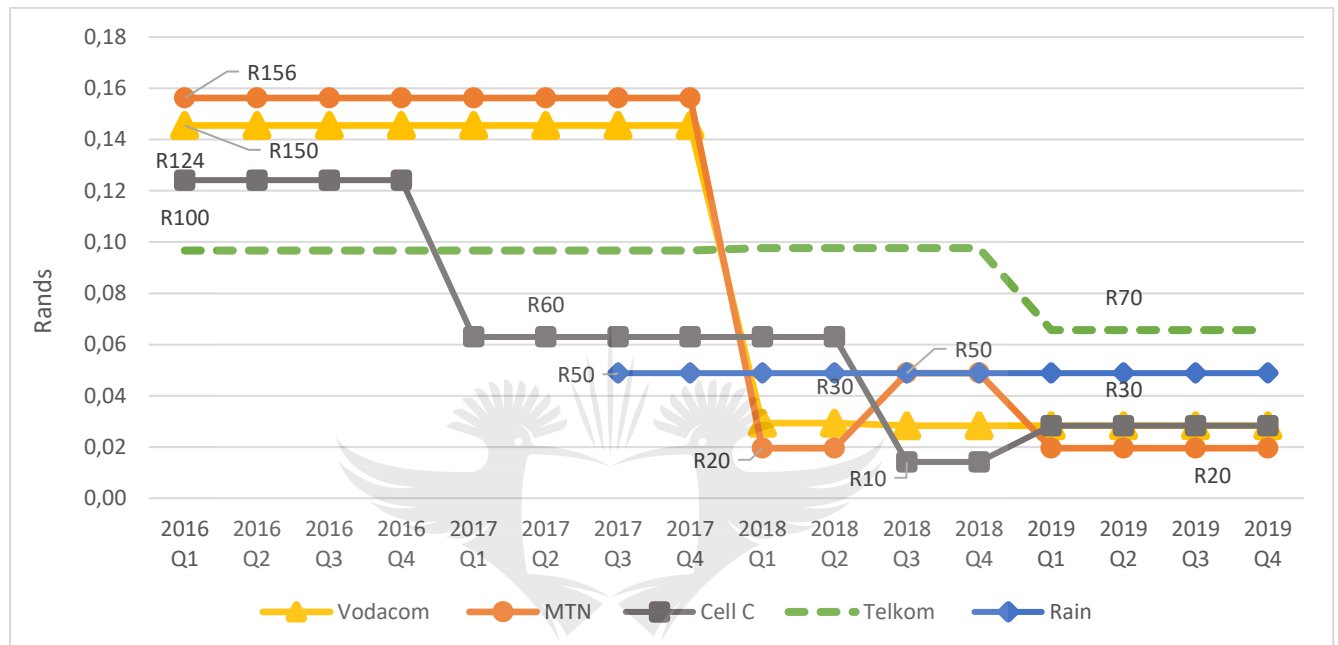
It was evident that the number and extent of promotional offerings of mobile operators increased significantly prior to the entry of Rain Mobile. The data showed that from around 2017 there were many more offerings by the mobile operators targeted at different segments of customers including mid-night surfers, social media users, and content streamers than they were in 2016. These promotional offers suggested a competitive response by the mobile operators to the entry of Rain Mobile, to the benefit of consumers who were intensive mobile-data users.

### ***Social-Media and Content-Streaming Promotions***

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 capitalise on the growth of OTTs and maximise their revenues (Odendaal, 2018). Over the last few years, mobile operators had been 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 had been able to introduce various promotional offerings to attract customers (Odendaal, 2018). These group of customers were largely young and heavy consumers of social content and want more data at the lowest prices (Appendix A). 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**



Source: ICASA Tariff Reports

Among the operators, Cell C was the only operator that offered its customers a WhatsApp data-bundle promotion from 2016. 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 2017, 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.

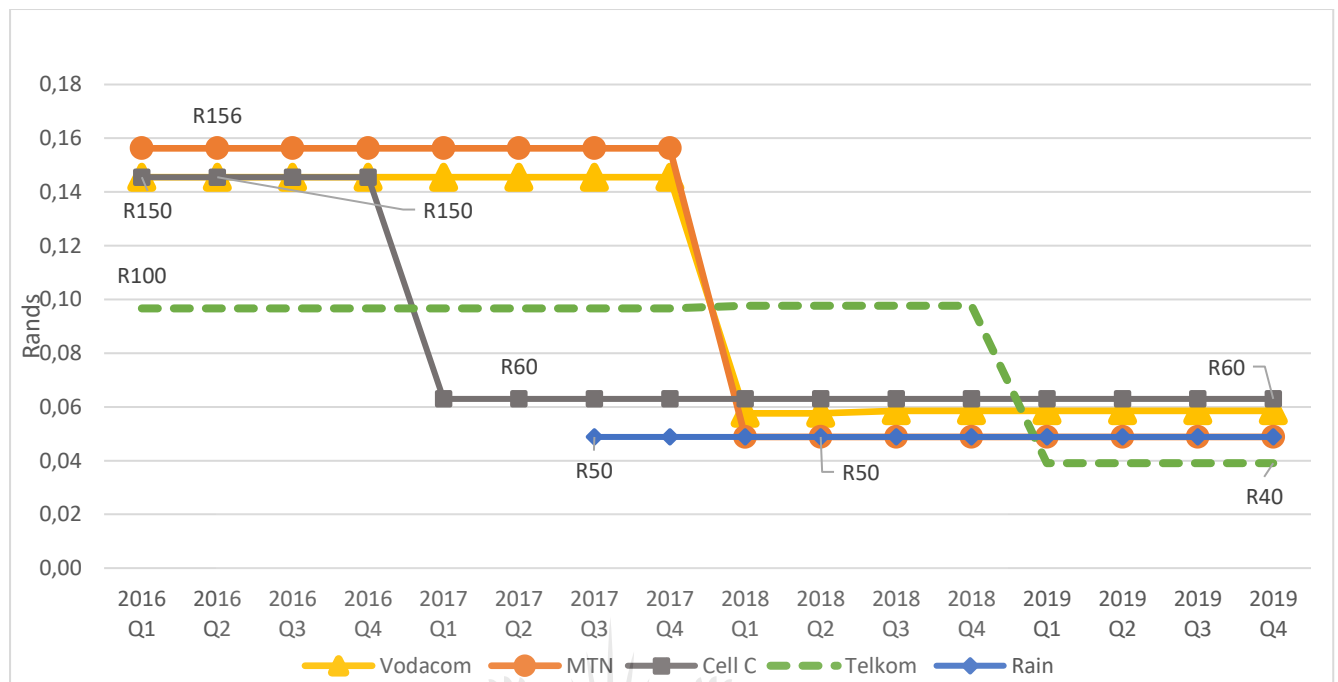
Just six months after Rain Mobile entered the market, both MTN and Vodacom dramatically reduced prices of their social media promotions. For WhatsApp-focused promotional data bundles, MTN dropped its effective rate from R156 per GB to R20 per GB, while Vodacom’s

promotional price was set at R30 per GB, dropping it from R150. Both offerings were lower than Rain Mobile'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 (Appendix A). 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 Mobile'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 Mobile. 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 Mobile 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 (Figure 4). 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.

**Figure 4: Effective Prices of the 1GB Social-Media-Bundle Promotions**



Source: ICASA Tariff Reports

Cell C was again the first operator to offer its customers a Social Media promotional bundle in 2017. Cell C’s social bundle gave customers access to Facebook for a period of 30 days at an effective rate of R60 per GB, which was 60% lower than Cell C’s standard 1GB data bundle. There was again no response from the other operators to Cell C’s low price. However, after Rain Mobile entered the market, both MTN and Vodacom responded with sharp reductions in prices through social media promotions. Unlike Cell C’s promotional bundle which limited the customer’s access to Facebook only, Vodacom’s 1GB social ticket offered customers access to Facebook, Instagram, Pinterest, Twitter, Tinder, and Tik Tok at an effective rate of R60, which was 62% lower than what customers were paying for the standard 1GB data bundle. When MTN introduced its social media bundles, it offered separate bundles for each of the social media platforms. The Facebook Social Media bundle offered customers monthly access at effectively R50 per GB, matching the price of Rain Mobile’s standard 1GB data bundle. This promotional offering reduced MTN’s effective price by 68% from what customers paid for the standard 1GB data bundle. Telkom was the last operator to introduce Social Media promotional bundles for its customers. Telkom’s offering enabled them to access the same social media platforms as Vodacom’s Social Ticket but also included Snapchat and LinkedIn, at an effective price of R40.

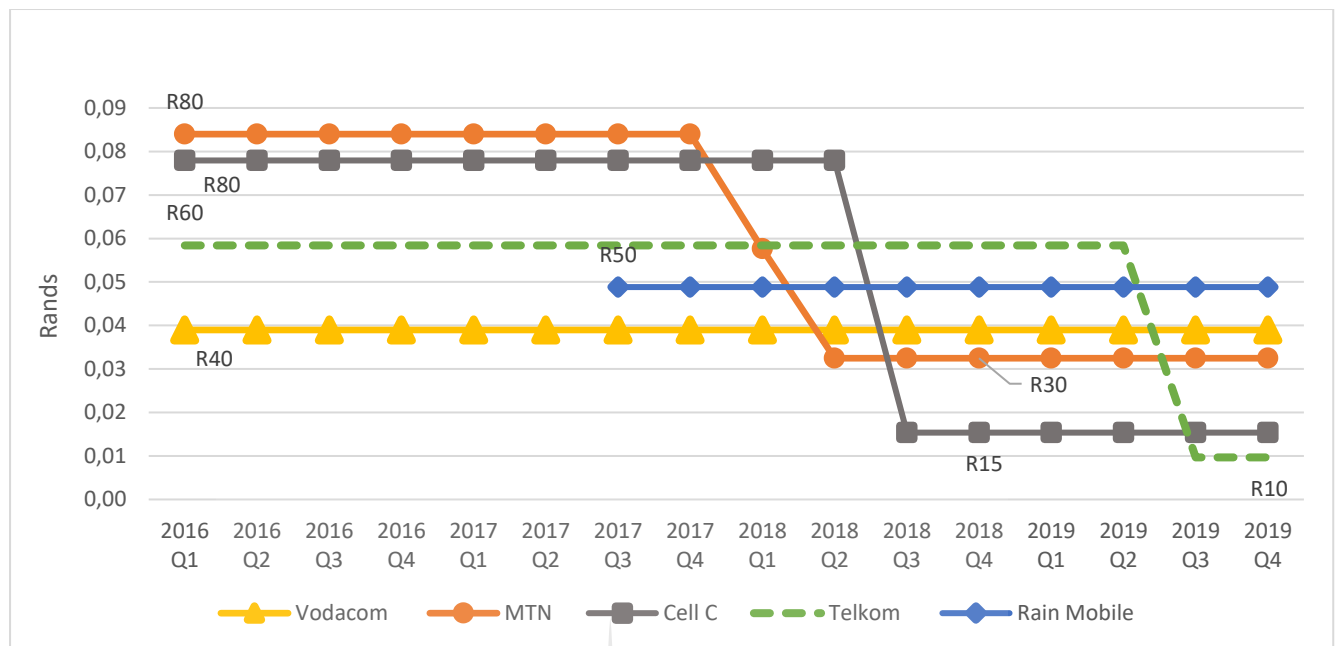
As with the assessment of the WhatsApp data bundles above, the effective prices reduce drastically on these Social Media bundles (by over 50%) shortly after Rain Mobile entered the

market. The reduced prices converged around Rain Mobile's effective price of R50 per GB. The same inference could be drawn about the timing of the price reductions and the impact of the new entrant on competition in the market. The evidence suggested that there was significant perceived willingness to switch by some customers of MTN and Vodacom. While these customers may not have switched to Rain Mobile, the perceptions about the operator and its offerings had stimulated the possibility of customers switching and has caused the incumbents to respond with radical price reductions through promotional offerings.

Promotional offers in the 5GB market had largely been on Double Your Data deals and later on Content-Streaming platforms. The Double Your Data promotions were widely offered by mobile operators and essentially gave customers a free data bundle that was the equivalent of the one purchased. Vodacom was the only operator that offered a 5GB WhatsApp promotional bundle while Cell C was the only operator that offered the Social Media bundle promotion, suggesting that the customers purchasing 5GB were not necessarily large consumers of WhatsApp or Social Media.

An assessment of the Double Your Data promotions for the 5GB data bundle indicated that operators were competing quite vigorously on this promotion and for similar data promotions. According to the market participants (Appendix A), customers that purchased the 5GB data bundles were generally heavy data users or family units who used the data on various platforms, including content streaming, work-related and educational platforms. This group of users generally shared the data with multiple users through a hotspot device, and therefore were particularly interested in promotions that gave them more data that could be used on multiple platforms, at the lowest cost (Appendix A). Vodacom was the industry leader on this offering and first introduced its Double Your Data promotions in 2016, at an effective price of R40 per GB.

**Figure 5: Effective Prices of the 5GB Double-Your-Data-Bundle Promotions**



Source: ICASA Tariff Reports

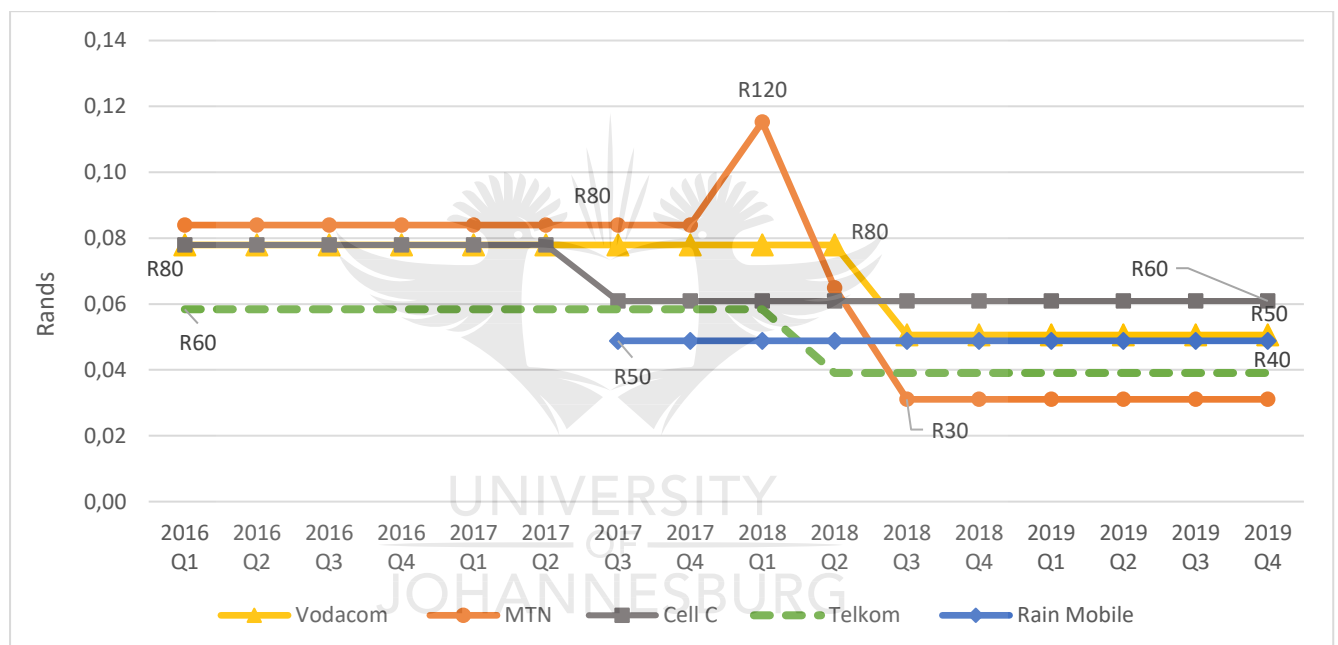
When Rain Mobile entered the market with its offering of R50 per GB, Vodacom's effective price remained the lowest among the operators. MTN and Cell C both reduced their effective prices through these promotions. In the second quarter of 2018, MTN reduced its effective prices, through its MyOffers promotion, by 63% to R30 per GB, beating both Rain Mobile 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 Mobile'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 Mobile, 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.

**Figure 6: Effective Prices of the 5GB Content-Streaming-Data-Bundle Promotions**



Source: ICASA Tariff Reports

Once again, there were almost no promotions on content streaming prior to the entry of Rain Mobile. The first effective price reduction happened in the third quarter of 2017 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 Mobile 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 Mobile 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 Mobile. Vodacom's promotional bundle reduced their effective price to R50 per GB, matching the price of Rain Mobile'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 Mobile. 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 of Figure 6 shows that Rain Mobile'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 Mobile'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 Mobile'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.

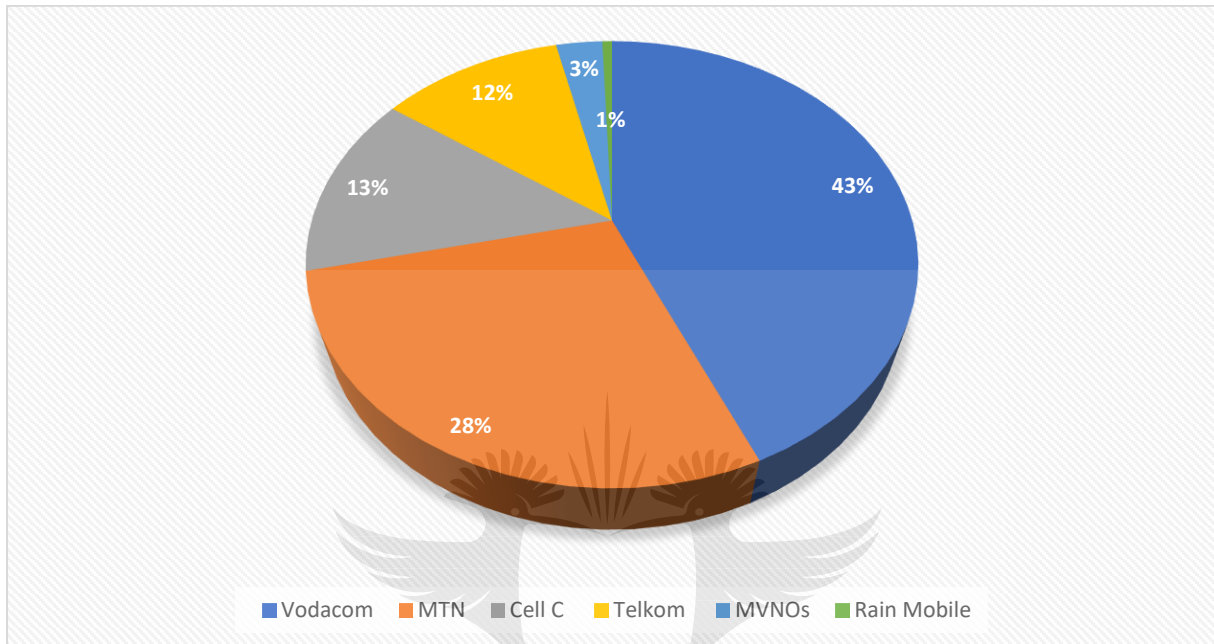
The evidence above seems to support the argument by market participants that there was much more vigorous competition between the operators on promotional offerings. An analysis of these offerings and discounts revealed that there had been price competition between the mobile operators, which had resulted 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 volume 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 study 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 study period was indicative of a positive customer response to the promotional offerings.

In terms of overall share of mobile subscribers, Rain Mobile had managed to gain around half a million subscribers on its 4G offering since entering the market in 2017 (Appendix A). This was equivalent to a 1% share of all prepaid subscribers (Figure 7). Rain Mobile's market in its first three years were substantially more than the 204 000 subscribers that Telkom had managed to gain in its first three years, and the 300 000 subscribers that Virgin Mobile (BusinessTech, 2012) had gained in the first four years of its operation (Hawthorne *et al.*, 2016). This indicates that Rain Mobile's entry has been quite effective, particularly considering the substantial barriers to entry that exist in this market.

Figure 7 provides an analysis on Mobile Operator share based on subscribers in 2019. The analysis was limited to prepaid customers because Rain Mobile 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 2016 data. This is reflective of a marked increase in competition in the mobile telecommunications market.

**Figure 7: Mobile Operator Share based on Prepaid Subscribers - 2019**



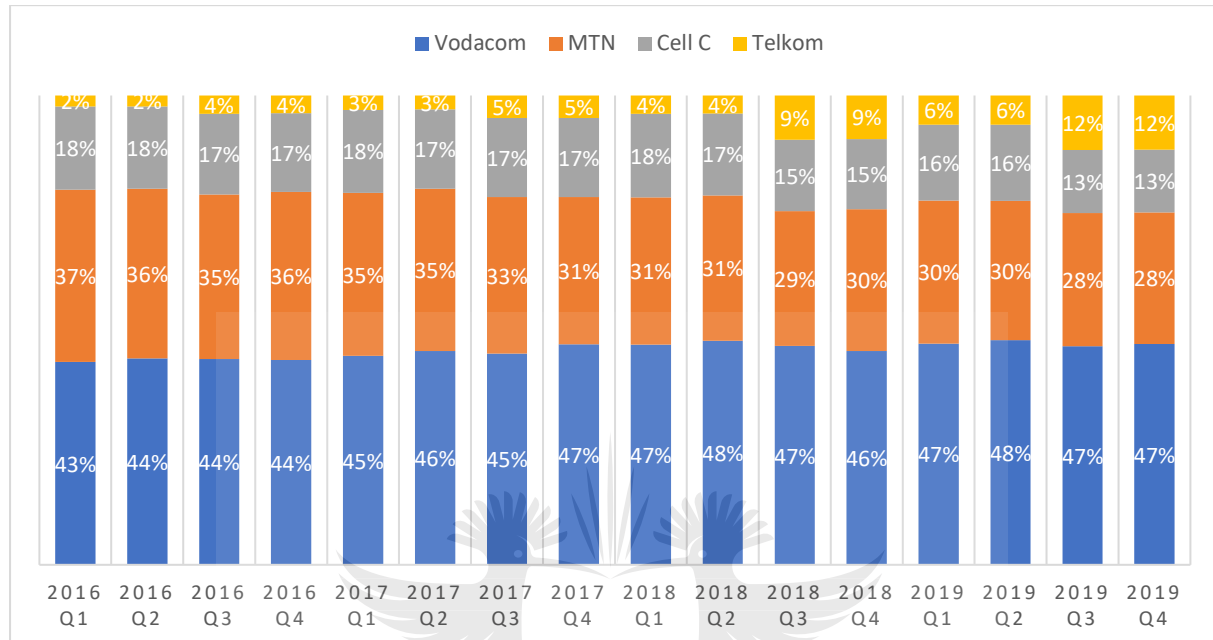
*Source: Annual Reports (based on the latest available as of 31 March 2020)*

In its latest annual results, for the year ended 31 March 2020, Vodacom reflected a total of 41.3 million total subscribers, 35.2 million being prepaid customers, while MTN reflected a total of 25.8 million subscribers of which 22.7 million were from its prepaid business. In the same period, Cell C and Telkom each reported that they had 12 million total subscribers. Of these, Cell C reported that 10.9 million were its prepaid customers while Telkom reported that 9.4 million were prepaid customers (MyBroadband, 2020). An assessment of prepaid subscribers, indicated that the incumbents still jointly held a large proportion of the market at 71% (Vodacom holds 43% while MTN holds 28%) followed by Cell C with 13%, Telkom with 12%, the MVNOs with 3% and Rain Mobile with just below 1% (MyBroadband, 2020).

The shares of the incumbents reflected in Figure 7 were lower than those that were reported in 2016/17. For instance, in the year ending March 2017, the incumbents jointly held 77% of the market while Cell C and Telkom held 17,3% (excluding the MVNOs) and 4,5%, respectively. The notable changes, have been the reduction in the MTN share, from 37% in the first quarter of 2016 to 28% in the fourth quarter of 2019, while Vodacom in contrast increased its share by three percent (Figure 8). Cell C also saw a reduction in its share of

subscribers from 18% in the first two quarters of 2016 to 13% in the last two quarters of 2019. Telkom has been the big winner amongst the operators having grown its share from just 2% at the beginning of 2016 to 12% in the second half of 2019.

**Figure 8: Growth in Prepaid Subscriber Shares - 2016 to 2019**



Source: Annual Reports

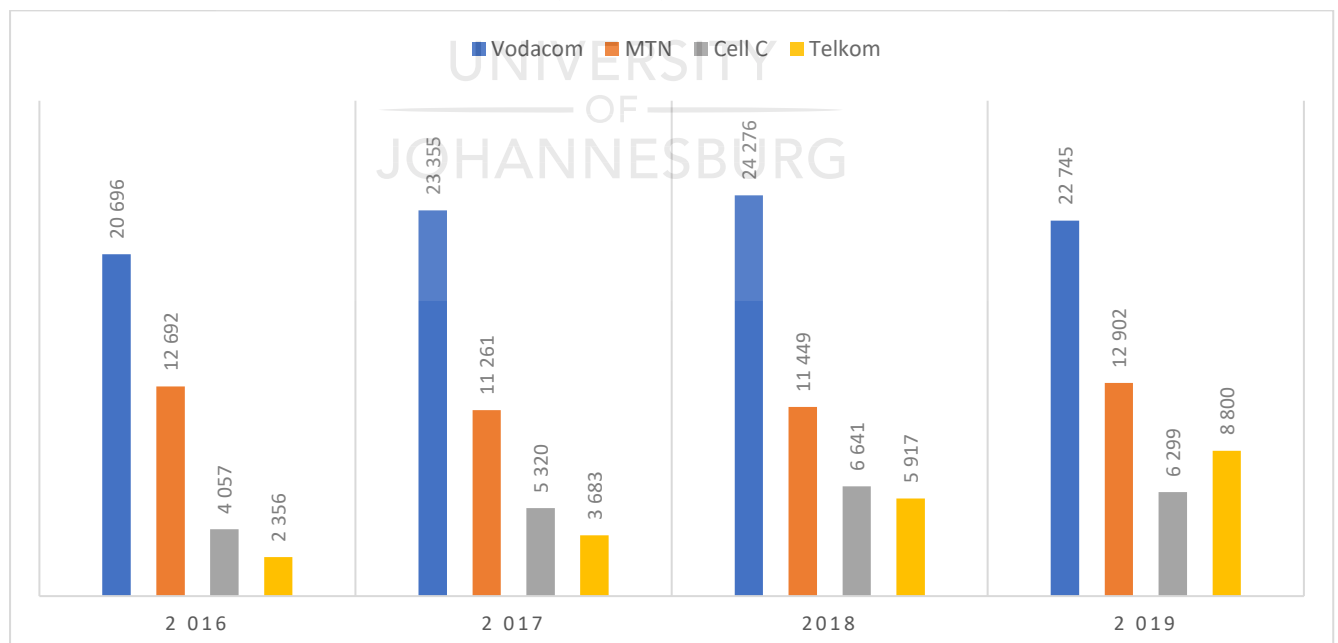
An assessment of Figure 8 indicates that there has been switching in the market, more notably from around the third quarter of 2017. In that quarter, the subscriber shares of both Vodacom and MTN declined by 1% and 2%, respectively from the previous quarter. Cell C's share stayed the same, but Telkom grew its subscriber share by 2% from the previous quarter. MTN's subscriber share fell by a further 2% in the fourth quarter. This could be explained by the fact that MTN, at that point, had the most expensive offerings on both the 1GB and 5GB data bundles as shown in Figure 1 and Figure 2 above. In the following quarter, MTN responded with changes in its offerings that reduced its prices below those of Vodacom, suggestive of a response to Vodacom. In the same quarter, Cell C's share went up by 1% while Telkom's dropped by 1%. The fall in Telkom's share may have been the result of the price increase on both their 1GB and 5GB bundle offerings in the same period.

The most substantial switching was seen in the third quarter of 2018 when Vodacom, MTN and Cell C lost 1%, 2% and 2% subscriber shares respectively. In the same period Telkom doubled its base from 3 million subscribers in the first quarter of 2018 to 7.8 million in the third quarter, a 5% growth in its subscriber share. By the end of 2019, Telkom had grown its subscriber base by 1.9 million to 9.4 million subscribers. The growth of Telkom's subscriber

shares appeared to be a direct consequence of their marked increase in investment in both infrastructure and marketing. Cell C responded with a reduction in headline prices of both the 1GB and 5GB data bundles almost matching Telkom's prices for both plans. In the same period Cell C had been reported to have had network issues, therefore, while it may have reduced its prices significantly, its customers were not happy and may have opted to switch to another operator (MyBroadband, 2018b). An assessment of the promotional-data offerings indicated that it was around this period when mobile operators began to aggressively introduce promotional offerings in both the 1GB and 5GB data bundle plans, indicating a response not only to the new entrant but also to Telkom. Telkom's growth in subscriber share suggested that they were responsible for decline in the subscriber share of MTN and perhaps Cell C. Throughout the period of study, Vodacom's subscriber shares continued to grow, despite not responding to any of the lower headline prices of the other mobile operators. While Rain Mobile's growth was negligible over the period compared to Telkom's, some inference can be drawn from the timing of the notable changes in subscriber share and the entry of Rain Mobile and the ability that the operator had to induce switching by customers.

There were also notable changes in the data revenues of the operators throughout the period of study, which were directly proportional to the changes in the subscriber shares.

**Figure 9: Growth in Mobile-Data Revenue - 2016 to 2019**



Source: Annual Reports

An assessment of Figure 9 shows that Vodacom had managed to grow its mobile data revenue by 10% within the period in line with the growth of its subscriber shares which increased from

43% in 2016 to 48% in 2018, before falling to 47% in 2019. Vodacom's ability to grow its revenues while still maintaining high headline prices was indicative of the operator's market power and dominance in the mobile telecommunications market. MTN only saw data revenue growth of less than 2% between 2016 and 2019, which was also explained by the fall in its subscriber shares from 37% in 2016 to 28% in 2019. In the same period, Cell C saw growth of 55% in its data revenue. The notable growth in data revenue was from Telkom, whose growth in subscriber shares from 2% to 12% grew its data revenue by over 270% between 2016 and 2019. Telkom's growth came almost 10 years after it entered the market in 2010. Telkom had maintained its position as the lowest-priced provider of mobile data services until Rain Mobile entered the market. Before Rain Mobile entered the market, there had been no response from the mobile operators to Telkom's low prices. This suggested that Rain Mobile was impactful in stimulating some competition in the market and inducing switching among customers. Although Rain Mobile had only grown its subscriber base marginally, the combined pricing pressure from both Rain Mobile and Telkom seemed to have sufficiently triggered a response from the incumbents. Rain Mobile's ability to offer mobile data at almost half the price of Telkom's offering may have been enough to induce some initial reaction from customers that saw them switching between mobile operators. While Rain Mobile offered the cheapest bundles, the fact that it did not offer a full service may have rendered Telkom the next best alternative for customers who wanted a full-service provider that offers affordable data but also reliable and superior quality. Alternatively, enabled by multi-homing, customers may have responded to the lower prices of Rain Mobile (and Telkom) for their data usage without necessarily leaving their original operator. Therefore, while subscriber shares of smaller operators may be growing, their growth may not necessarily mean that the subscriber share of the incumbents will decline drastically.

### **5.3. 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 (Appendix A).

#### ***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 (Appendix A).

Data on 4G or LTE rolled-out by each of the operators showed that Rain Mobile had done well compared to competitors Cell C and Telkom. Instead of trying to build its own infrastructure, Rain Mobile entered an infrastructure sharing agreement with Vodacom, which enabled Rain Mobile 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 Mobile 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 Mobile 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, 2019c). In 2018, Cell C had 2 900 4G or LTE sites in the country (BusinessTech, 2018). By 2017, Vodacom had just over 7 900 4G or LTE sites nationally (BusinessTech, 2017), 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 2018 Vodacom was the leading operator, providing the widest 4G coverage in the country followed by MTN. Rain Mobile was the third largest provider of 4G coverage, surpassing both Cell C and Telkom (MyBroadband, 2018c).

**Figure 10: Network Coverage in South Africa - 2018**

<b>Operator Population Coverage</b>			
<b>Operator</b>	<b>Overall Data Coverage</b>	<b>3G Coverage</b>	<b>4G Coverage</b>
<b>Vodacom</b>	99.9%	99.4%	77.6%
<b>MTN</b>	99.9%	97.0%	75.0%
<b>Cell C</b> (Including roaming)	99.6%	96.0%	32.0%
<b>Telkom</b>	56.0%	56.0%	40.7%
<b>Rain</b>	50.0%	–	50.0%

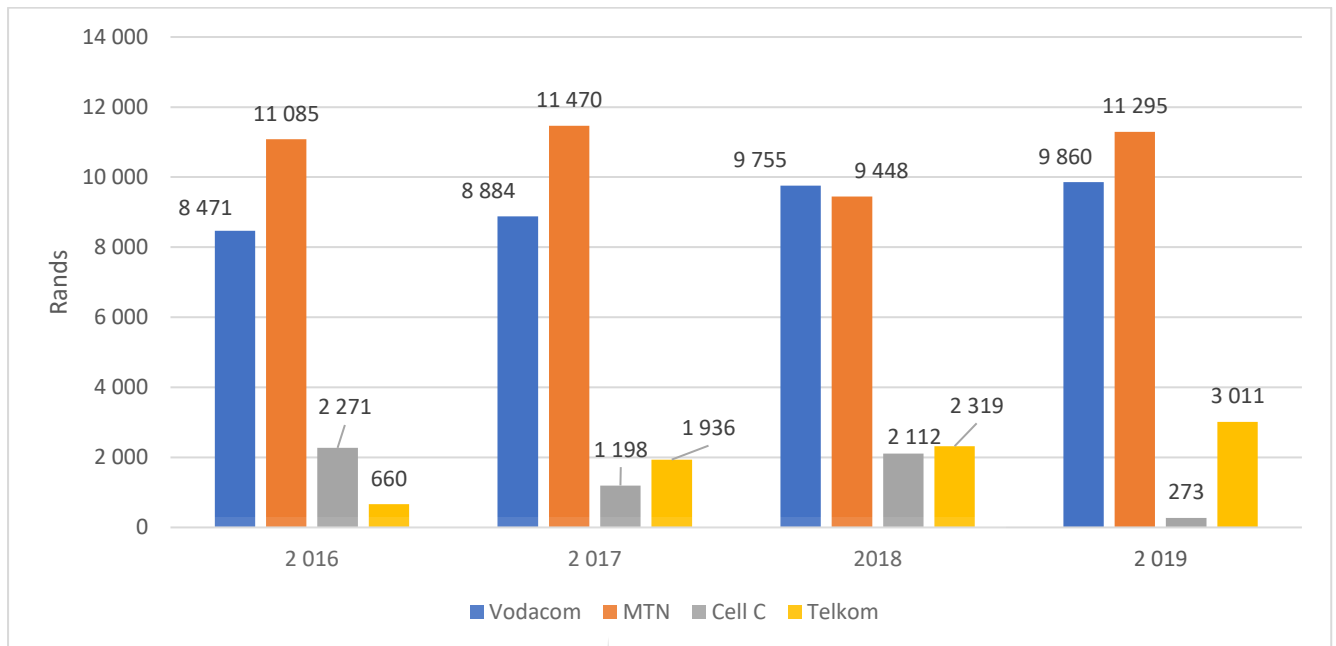
*Source: MyBroadband, 2018c*

According to market participants (Appendix A), Vodacom and MTN were the only operators able to provide national coverage because of their extensive infrastructure, while the smaller operators could only cover a fraction of that. While roaming agreements assist small operators achieve national coverage they still rolled-out their own infrastructure. The Competition Commission (2019, p. 23) found that such agreements are often one-sided in favour of the incumbent operators, with high minimum payments required, high marginal rates, poor roaming quality through lack of seamless handover, and denial of roaming for new-data service lines. The fact that Vodacom and MTN were the only networks with national coverage and thereby the only options for small operators seeking national roaming agreements, further entrenched the dependency of smaller operators on the incumbents which limited their bargaining leverage. The case of Rain Mobile is a rare example of a smaller operator having better leverage and being able to extract a better outcome. In concluding their agreement, Vodacom benefitted from Rain Mobile’s additional capacity which helped it overcome some of its network capacity constraints and provide its consumers with better coverage while in turn Rain Mobile could extract better site access and roaming rates from Vodacom (Competition Commission, 2019, p. 23).

Large capital expenditure s required to provide wide coverage of data services and ensure sufficient capacity to maintain high network-quality levels.



**Figure 11: Mobile Operators' Capital Expenditure - 2016 to 2019 (Rm)**



Source: Annual Reports

An assessment of Figure 11 indicated the significant capital investments made by the mobile operators between 2016 and 2019 in order to broaden coverage and improve accessibility and network quality across the South African landscape. Notably, Telkom's investment spending, which increased by over 50% from 2016 to 2017, surpassed that of Cell C, despite having entered the market much later than Cell C.

With customers demanding more and faster data, the quality of mobile data networks is becoming increasingly important. Accordingly, mobile operators regularly upgrade their networks to offer improved benefits to customers in terms of service quality and cost. Telkom indicated that increasing its capital expenditure was critical to ensuring that it could provide wider coverage and services of superior quality, and ultimately grow its subscriber base (Appendix A). Since its inception, Telkom was synonymous with poor-quality services and coverage. The negative impact of these issues significantly affected Telkom's ability, in its initial years, to grow its subscriber shares in competition with operators Vodacom, MTN and Cell C (Appendix A). The operator's substantial investments in infrastructure has enabled it to widen its coverage to areas where it previously had no network coverage, and thereby gain additional subscribers in those areas, and more generally as shown in Figure 11 above.

To meet the growing demand for quality, high-speed and reliable data services, mobile operators require access to high-end spectrum which will enable them to carry high traffic without compromising the quality of their services.

**Figure 12: Mobile-Spectrum Allocation**

<b>Mobile Spectrum</b>					
<b>Spectrum Band</b>	<b>Vodacom</b>	<b>MTN</b>	<b>Cell C</b>	<b>Telkom</b>	<b>Rain</b>
<b>900Mhz</b>	22MHz	22MHz	22MHz	—	—
<b>1,800MHz</b>	24MHz	24MHz	24MHz	24MHz	34MHz
<b>2,100MHz</b>	30MHz	30MHz	30MHz	30MHz	—
<b>2,300MHz</b>	—	—	—	68MHz	—
<b>2,600MHz</b>	—	—	—	—	15MHz
<b>3,500MHz</b>	—	—	—	28MHz	142MHz
<b>Total</b>	<b>76MHz</b>	<b>76MHz</b>	<b>76MHz</b>	<b>150MHz</b>	<b>191MHz</b>

*Source: MyBroadband 2019*

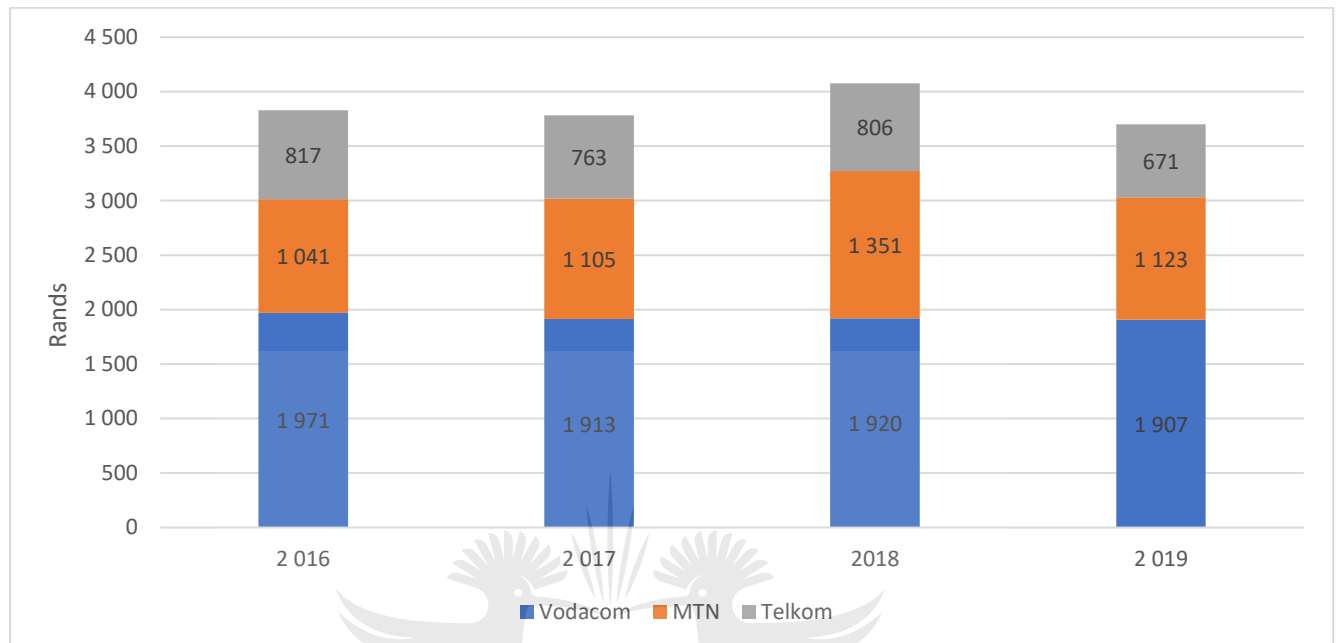
Through its acquisition of WBS, Rain Mobile obtained access to valuable high-frequency spectrum in the 1800MHz, 2600MHz, and in the scarce 3500MHz bands, which none of the other mobile operators had, except Telkom. An assessment of the nature of Rain Mobile's spectrum illustrated why the operator had been able to surpass Cell C and Telkom in terms of 4G coverage and service quality, even though the two operators have been in the market for much longer. The delays in the allocation of spectrum in South Africa significantly constrained the ability of the other operators to roll-out 4G or LTE at the same speed as Rain Mobile did. Vodacom and MTN had to re-farm a significant portion of their spectrum to roll-out their 4G or LTE networks (MTN, 2019, p. 45). The delays by ICASA gave Rain Mobile a competitive advantage over its rivals. Rain Mobile was able to leverage off its existing 4G network infrastructure to build the 5G network in its regulated 3600 MHz spectrum band, surpassing industry leaders Vodacom and MTN and becoming the first mobile operator to roll-out 5G network in South Africa.

### ***Reputation & Brand Awareness***

While service quality is important to customers, perceived quality is also a key driver of brand awareness and reputation in telecommunication markets (Bhattacharjee, 2016). According to market participants (Appendix A), standing out in the telecommunications market is not always easy because mobile operators offer similar products. Marketing and advertising are important for mobile operators in raising brand awareness and, more importantly, in attracting new customers. Telkom has directly attributed the growth in subscriber shares to the increased marketing of the brand (Appendix A). Over the years, incumbents, Vodacom and MTN have

been able to undertake aggressive marketing and advertising campaigns because they have big budgets compared to smaller operators.

**Figure 13: Marketing Expenditure of Vodacom, MTN and Telkom: 2016 – 2019 (Rm)**



Source: Annual Reports

Between 2016 and 2019, Vodacom and MTN spend over R7 billion and R4 billion respectively on marketing and advertising. They have been able to substantially grow revenues due to their wide subscriber base. Their greater scale enables the incumbents to achieve a lower unit-cost base compared to smaller operators (Competition Commission, 2019, p. 22). The incumbents have, as a result, managed to sustain these high marketing budgets. Smaller operators work off a base of fewer subscribers and are not able to match the marketing budgets of Vodacom or MTN because in doing so they may risk spending a disproportionate percentage of their revenue on marketing and advertising. In comparison to the incumbents, Telkom as a group had spent just over R3 billion in the same period. Telkom's strategy to increase its marketing budget has enabled Telkom to rebrand and reposition their mobile brand, away from the legacy of the unsatisfactory reputation of the Telkom fixed-line business. Telkom has rebranded as a mobile operator that provides reliable services of superior quality, to attract good-quality subscribers. Like the other small operators, Rain Mobile's advertising budget is negligible compared to that of Vodacom and MTN (Appendix A). In raising awareness around its brand, Rain Mobile has focused on its ability to set itself apart from the other operators through innovation and offering customers products and prices that no other competitor can.

## **5.4. Assessing the Effectiveness of Rain Mobile**

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). 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.*, 2016, Maicas and Sese, 2011, Fuentelsaz *et al.*, 2010).

### **5.4.1. 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 has given the incumbents significant first-mover advantages over all the other operators and that this hinders 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 (Appendix A). Even more is needed to maintain these sites. The Competition Commission (2019, p. 22) found that incumbents MTN and Vodacom have large subscriber bases and profitability levels, compared to smaller operators, which provide them with considerable advantage in the rolling out of new technologies and services.

One of the biggest advantages enjoyed by MTN and Vodacom, as first movers, has been their ability to grow a large subscriber base and levels of profitability that have enabled them to roll out new technologies and services faster than smaller operators. Rain Mobile 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 Mobile however was able to invest heavily in LTE-A technology which would enable it to provide more data, faster data, better quality data (Jordaan, 2017).

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 consumers that are still using devices on those networks (van Zyl, 2017). According to the market participants (Appendix A), 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 Mobile 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..

#### **5.4.2. 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.*, 2016). 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 muted in the data market where closed-network pricing cannot be used as a strategy to exclude new entrants. The fact that Rain Mobile 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 Mobile is completely immune to the negative impact of network effect on new entrants. Unlike the incumbents, Rain Mobile 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 Mobile'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 (Appendix A). Thus, while national coverage is important, Rain Mobile'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 Mobile because it must compete for the customers of network operators that offer both traditional services and data services. Because Rain Mobile 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 Mobile 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 Mobile SIM solely for data services. The advantage for Rain Mobile is that customers do not have to be burdened with the decision to choose between their original mobile operator and Rain Mobile 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 Mobile 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 Mobile. In weighing the costs of switching, these customers would not consider Rain Mobile an attractive alternative. Furthermore, Rain Mobile 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 Mobile has successfully been able to set itself up as a contestable operator in the market. With its targeted offering, Rain Mobile 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 Mobile's offerings attractive. The assessment of price competition above shows that one of the obstacles that Rain Mobile 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.

## Chapter 6

### CONCLUSION

This research study assessed the impact of a new entry on the nature of competition in the South African mobile telecommunications market, using Rain Mobile as a case study. The study assessed the extent to which Rain Mobile 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 study 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 study 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 study 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 study found that the reduced prices of both operators still remained much higher than those of Rain Mobile on both bundles. These findings are in line with those made by the Competition Commission which indicated that there was inadequate price competition among the mobile operators on headline prices of mobile data and that these prices remained high. 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 also argued that while headline prices remained unchanged, effective prices of mobile data had fallen significantly. In line with this argument, this study 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 study 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 study 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 Mobile, operators began to introduce promotional offerings targeted at specific customer segments. The study showed that effective prices of mobile data for all the operators dropped significantly when these promotions were introduced, even below the price of Rain Mobile in some instances. These results indicated that the impact of entry of Rain Mobile 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 study found that the low prices were only beneficial to targeted consumers that were active on those social platforms where promotional discounts are offered and not the broader customer base. The finding was consistent with that of the Competition Commission (2019, p. 269) 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 study found that mobile operators were able to partition their customers by targeting their promotions and lower prices to those customers that found Rain Mobile'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. Therefore, while the study showed evidence of an increase in competition, this was only limited to the group of targeted customers and did not extend to the broader customer base.

The assessment of market shares showed that Rain Mobile 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 study also showed that Rain Mobile 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 study showed that Vodacom had been able to grow even in the wake of new competition but MTN's share had declined. The striking difference between the two incumbents indicated that 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 study 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 study revealed that mobile operators also competed on factors such as coverage, quality, reputation, and/or brand awareness. On the assessment of brand awareness and reputation, the study shows 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 Mobile's spend on marketing was negligible compared to the incumbents. The assessment of quality and coverage showed that Rain Mobile 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 Mobile 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 Mobile 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 influenced by the existence of barriers to entry, network effects, and first-mover advantage. The study showed that as a new entrant, Rain Mobile was impacted significantly by switching costs and to a lesser extent by first-mover advantages and network effects. Despite having the lowest offering, Rain Mobile was competing against operators that were offering full traditional services while it offered data only services. The study showed that typical user of Rain Mobile would still need to remain with their operator (either Vodacom, MTN, Cell C or Telkom) for voice and messaging services as Rain Mobile did not offer those services. Consequently, customers could be reluctant or just not afford to multi-home or switching between operators. The study showed that incumbents employed strategic actions to persuade customers not to switch, by offering them data services at low prices. While Rain Mobile 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 entrants and smaller operators of sufficient subscribers to achieve the required economies of scale.

In offering targeted services, Rain Mobile, was effective compared to other non-traditional service providers such as MVNO's. The study showed that Rain Mobile'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 Mobile's customers could access all those platforms as well as other Internet services on the operator's standard plan.

The evidence from this study indicated that Rain Mobile'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 study 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 Mobile's low price showed that Rain Mobile'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 study showed that Rain Mobile 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 study 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 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 Mobile 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 study of Rain Mobile indicated the contrary to a certain extent. The evidence showed that even with access to high-demand spectrum, the impact of Rain Mobile was only evident in a small segment of the market but 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 study showed that the roaming and facilities-sharing agreement with Vodacom was crucial in enabling Rain Mobile 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 Mobile 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 study 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 study highlight the importance of economic theory in understanding the ability of incumbents to segment customers and build profiles with specific targeted customers. The study showed that mobile operators were able to reduce effective

prices of mobile data through targeted promotional offerings. Although the study 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 study showed that promotions were targeted and benefitted only a small 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 study 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 study of Rain Mobile 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 study 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 study 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 co-ordinated regulation to maximize the benefits that could be derived from competition.

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## **Appendix A: Interviews**

Bertus van der Vyver, Managing Executive: Customer Value Management. Telkom on 22 September 2020.

Cheryl Dinkelman, Senior Manager: Special Regulation & Consumer. MTN. 9 November 2020.

Joseph Kgamed, Head of Regulatory Affairs. Rain Mobile. 6 October 2020.

Rossana Gell, Senior Manager: Market & Competition Regulation. MTN. 9 November 2020.

Themba Phiri, Executive Head: Regulatory. Cell C. 16 September 2020.

