

The effect of the regulatory environment on telecommunications performance in South Africa

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A research report submitted to the Faculty of Commerce, Law and Management,
University of the Witwatersrand, in partial fulfilment of the requirements for the
degree of Master of Business Administration

Johannesburg, 2015

Feb 2015 version

ABSTRACT

Telecommunications technology development has changed the world in very significant ways, and more dramatically so with the advent of mobile wireless telecommunications. The causal relationship between ubiquitous telecommunications access and socio-economic development has been proven empirically in research and a variety of case studies.

Two decades after mobile telecommunications services became available in South Africa, the country has fallen behind many other nations in reaching the triple regulatory policy objectives of ubiquitous, good quality telecommunications access, available at affordable prices. Consequently, the proven socio-economic benefits that stem directly from telecommunications connectivity remain largely elusive in South Africa.

This research investigates the reasons for telecommunications regulatory policy failures in South Africa, and looks for ways to improve that poor industry performance on policy objectives.

This research uses interviews with purposively chosen executive leadership in the telecommunications industry to collect data. Grounded theory is used as the primary analysis strategy, and mathematical modelling using Fuzzy Cognitive Mapping (FCM) as a secondary one.

The principal finding of this report is that the main telecommunications policy objectives are unlikely to be achieved simultaneously within the current industry structure. This reality presents a tricky challenge to the regulatory authorities because it indicates contradicting policy prescriptions.

The report discusses the regulatory options available to the authorities and provides a prognosis of their effect on the performance of the industry. The report concludes with comments on the strategic shifts that the industry players could make to meet the regulatory authorities half way.

DECLARATION

I, Simphiwe Siyabonga Ntombela, declare that this research report is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

Simphiwe Siyabonga Ntombela

Signed at

On the day of 20.....

DEDICATION

To the exceptional brains behind the discovery, perfection, implementation and ongoing evolution of mobile telecommunications technology, whose genius has lifted the lives of multitudes around the world.

To the leaders and drivers of the telecommunications industry in South Africa, whose vision and enterprise has brought about an entirely new way of life for South African citizens, residents and visitors.

To the men and women at ICASA and other Regulatory Authorities, past and present, whose comprehension, hard work and commitment to the digital development of the country is often questioned, and whose challenges are often trivialised.

ACKNOWLEDGEMENTS

I wish to express my heartfelt appreciation to:

- My supervisor, visiting Professor Anton Roodt, for not only providing insightful academic advice, but also calming me down on tough days.
- My wife Luvo, and my boys, for your love and support, and giving me the space when I needed it, and being there when I need you.
- My mother Nocamagu, for providing the essential spiritual pillar, for me and my family.
- All my research respondents, for not only participating in the interviews and talking so openly, but also for suggesting and introducing me to other valuable sources of information.
- A special thanks to Zunaid Bulbulia, Group Executive at MTN, for always having his door open to me, which eventually inspired the topic of my research.

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Definitions and Abbreviations

Asymmetrical interconnect rates (Asymmetry): the regulation whereby a large operator pays a bigger operator a higher rate for terminating mobile traffic on the smaller operator's network, while the smaller operator pays less for their traffic terminating on the larger operator's network

Digital Dividend: the frequency spectrum currently occupied by the national broadcaster, SABC, and due to be released to telecommunications operators upon completion of the SABC migration to the digital platforms

ECA: Electronic Communications Act (Act 36 of 2005)

ECN: Electronic Communications Network

ECNS: Electronic Communications Network Services

Interconnection rate: see MTR

Local Loop Unbundling (LLU): Local Loop Unbundling is the process whereby a licensee is obliged to provide access to the local loop (last mile) at a wholesale price so that other licensees may access end-users

Mobile Termination Rates (MTR): tariffs operators charge one another for placing telecommunication traffic on one another's networks

Mobile Telecommunications Network – the infrastructure points that are deployed and linked up to enable telecommunications services through physical links as well as electro-magnetic waves technology

MVNO: Mobile Virtual Network Operator, a telecommunications business model whereby the operator offers mobile telecommunications services without owning any network infrastructure, but leasing capacity from another mobile network operator's network

Network Operator: business entity that operates a mobile telecommunications network

Regulator: ICASA

Regulatory Authorities: State institutions that have the right to pass or administer legislation, regulations and policy

Regulations: the set of laws, decrees, rules, practices or government formalities which govern the political economic and social domain

RICA: Regulation of Interception of Communications and Provision of Communication-related Information Act, Act 70 of 2002

Regulatory authority: a public authority or government agency responsible for exercising authority over and monitoring some area of government activity in a regulatory or supervisory capacity

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1 CHAPTER 1 - INTRODUCTION

1.1 Purpose of the study

The purpose of this research is to investigate the reasons for the poor performance of the telecommunications industry in terms of the regulatory objectives in South Africa. The research seeks to understand the pressures, challenges and frustrations faced by the key industry players in supporting and contributing to the achievement the triple goals of (i) universal access, (ii) high quality telecommunications connectivity and (iii) affordable telecommunications, for the citizens of South Africa. What policy levers are available to the Regulatory Authorities, and how effective are they when exercised? Are there any unintended consequences of policy implementation? Options that the authorities can pursue in their quest for these and other complementary objectives are explored from the point of view of the industry players.

1.2 Context of the study

Key terms: (i) regulatory environment (ii) regulatory objectives (iii) regulatory authorities (iv) regulatory policy tools (v) mobile network operators (vi) telecommunications service providers

Telecommunications technology development has changed the world in very significant ways, and more dramatically so with the advancement of mobile wireless communications over the last three decades or so. According to GSMA, mobile phones are the most widely adopted consumer technology in history (GSMA, 2013). The success of mobile can be linked to rapid advances in technology, innovation in product and service design, and strong latent demand from many billions who had yet to make a phone call (GSMA, 2013). Telecommunications has the potential to lift

the standard of living of a nation quickly and significantly. The causal relationship between telecommunication infrastructure development and universal access on the one hand, and socio-economic development on the other has been proven empirically in research and a variety of case studies (Beardsley, Bugrov, & Enriquez, 2005; BusinessReport, 2014). For instance in the OECD countries, ICT, of which telecommunications is a part, contributed as much as 4% to the GDP growth of some countries, from below 1% two decades ago (Olivier Boylaud, 2001). In South Africa, Statistics South Africa reported that the ICT sector contributed 6% to GDP in 2011/12, up from below 2% in 1994, and the telecommunications component alone grew from nothing to over R179 billion over a period of only seventeen years from inception (SAGovernment, 2014), mainly driven by the rise of the mobile cellular industry. As telecommunications is an input and enabler in virtually every sector of the economy (NationalPlanningCommission, 2012), the indirect value added in facilitating and enabling other industries to improve business and economic activity is likely to be even higher than those figures due to the knock-on effects. Advances in ICT technology and expertise have facilitated innovative applications in banking, health management, learning and education, online transacting, to name only a few. Newer applications include digital identity, mobile money, early warning and disaster response, lifestyle monitoring, and energy management technologies. All these applications are mostly driven by the advancing capabilities of mobile telephone technologies and platforms. Telecommunications has thus become a central and core part of life and of doing business for individuals, businesses, governments, and other institutions of society. South Africa looks up to the telecommunications industry to play its proven developmental role and spur the country to a higher development

plane as it seeks to take its place next to other developed nations in the information age and knowledge economies of the future.

Lamentably, the potential for the telecommunications industry to deliver the country to that higher socio-economic plane has not been realised over the last two decades in South Africa. The key industry players and the Regulatory Authorities on the one hand, and the industry players amongst themselves on the other, have been embroiled in recurrent adversarial conduct in more recent times, with the result that the objectives which have been set by the Regulator have had limited success (Gillwald, Moyo, & Stork, 2012) at best. For example in 2005, then President Thabo Mbeki bemoaned the high cost of communication in South Africa, a sentiment that was repeated by President Jacob Zuma almost five years later (SAGovernment, 2014). Furthermore, the Regulatory Authorities have been dogged with various challenges of their own at different times, which did diminish their ability to drive their mandate successfully and consistently. (Gillwald et al., 2012).

The sum-total of this situation is a conflicted and unsettled industry that is not succeeding to move the country forward as desired, but mostly focused on maximising their short term profits for their shareholders at any cost to society. Even historically poorer-performing African countries such as Morocco have reportedly surpassed South Africa in broadband penetration for example, while their headline prices are significantly lower than South Africa's by comparison (Gillwald et al., 2012).

At least in public, the regulatory objectives in South Africa invariably receive "in principle" acceptance within the key industry players. The main objectives of universal access, affordable prices, and good quality of service are generally in line with international best practice (Dyner & Larsen, 2001; Gillwald, 2005; Olivier

Boylaud, 2001), but have remained largely unachieved (Gillwald, 2005; Reporter, 2013) as their pursuance has been slowed down by disputes and litigation. With no swift dispute resolution mechanism in place thus far, a fair amount of mistrust has set in and has boiled over into open hostility at times. The more recent instance is the legal battle between ICASA and MTN/Vodacom, occasioned by the Regulator's decision to further reduce the MTR (SABCNews, 2014), with Cell C and Telkom Mobile being supportive of the Regulator. This adversarial relationship is clearly not helpful in advancing the national objective of broadband growth articulated in the growth blueprint of the country, the National Development Plan (NationalPlanningCommission, 2012). Neither does it provide the private sector operators with the necessary climate for making long term investment decisions that are so critical to lifting the industry and the country up to a higher economic trajectory, as is their potential to do. The effect of these shortcomings is a set of suboptimal outcomes for the customers, the telecommunications companies, the industry in general and the national economy; a lose-lose situation.

1.2.1 Research issue

The issue is that two decades after mobile telecommunications services became available in South Africa, the country has fallen behind many other nations in reaching the regulatory triple policy objectives of ubiquitous, good quality telecommunications access at affordable prices. Consequently, the proven socio-economic benefits that stem directly from telecommunications connectivity have largely not been realised in South Africa. This research investigates the industry explanations for this failure, particularly as they relate to industry regulations and policy, and solicits their suggestions for improving the situation.

The causal relationship between the telecommunications regulations and the behaviour of key industry players is not clearly understood in South Africa. In particular, the experiences and views of the commercial players about the effect of Regulations have not been adequately recorded or shared to the extent that the Regulatory Authorities' objectives have. This is understandable because access to company strategies, including the regulatory response and management doctrine, is a private and confidential arena (Shaffer, 1995) and thus external or public access is limited. Having obtained unique access to key commercial players in the industry, this researcher investigates the effect of regulations on the private telecommunications businesses, and seeks to understand why the regulatory objectives have not been achieved by them individually and collectively as an industry. Furthermore, the views of what is required by the businesses, individually and together with others as the industry, from the Regulatory Authorities in order to perform better on the policy objectives are solicited.

1.3 The Research Problem

The research problem is to investigate, analyse and evaluate the reasons and explanations for the country's poor achievement of regulatory policy objectives in the telecommunications industry in South Africa, and to establish the industry views of what is required to better achieve them.

1.3.1 Sub-problem 1 – Reasons for poor policy outcomes

The first sub-problem is to determine the reasons and explanations for the variance between the regulatory policy objectives on the one hand, and the telecommunications industry performance on those objectives on the other.

1.3.2 Sub-problem 2 – Requirements for meeting policy objectives

The second sub-problem is to establish the industry's requirements and expectations for improved achievement of the regulatory policy objectives in the telecommunications industry in South Africa.

1.4 Significance of the study

South Africa experienced a period of high economic growth in the first decade after the first democratic elections in 1994, with good economic policies under development. A strong element of human goodwill both internally and from abroad also helped. However, since the economic crisis of 2008/09 that growth has since slowed down significantly, and the level of national goodwill seems to have diminished markedly. The challenges of unemployment, poverty and economic inequality are generally agreed to be the key defining features of the South African economy today.

Under these conditions, all avenues for economic growth need to be harnessed to their maximum potential. The telecommunications industry holds an enormous but unrealised potential to make a significant contribution to that effort. It is thus critically important to identify and remove any stumbling blocks that are in the way of this industry to make its fair contribution of propelling the citizens into the modern age of knowledge and thus uplifting their standard of living.

Accordingly, the results of this research may assist the Regulatory Authorities in deepening their understanding and appreciation of the pressures that the key industry players are faced with, and may provide insight into improved regulatory approaches. Amendments, complementary and/or supplementary interventions by the Regulator may be considered, and even abandonment of some policies under

consideration that may be negative and thus unlikely to find resonance and traction with the commercial players upon implementation.

Potential entrants into the industry, foreign investors and risk rating agencies may find the information useful, because the state of telecommunications development in a country is an important input into models for both entity (individual company) and sovereign (country) risk valuation.

Lenders of finance may also benefit from this research, because regulatory certainty is one of the key inputs in crafting lending and business partnering business cases. Understanding the success criteria from a regulatory perspective may provide them a “scorecard” basis for their risk mitigation strategies.

The ultimate beneficiaries of a stable and performing telecommunications industry are the end-users, who stand to enjoy the benefits of a stable and enabling industry, which also contributes to economic growth for the nation.

1.5 Understanding the industry

This section provides a brief background knowledge of the telecommunications industry in South Africa in order to better appreciate the research setting. It is only for the benefit of readers who are not familiar with the makeup of the telecommunications industry.

1.5.1 Industry structure in South Africa

The exact description of the telecommunications industry is complex and even elusive. Li and Whalley (Li & Whalley, 2002) noted that before the telecommunications services reach the end customer, a multitude of industry players form part of the delivery process. These include telecommunications equipment vendors, infrastructure companies, software vendors, financial intermediaries,

content providers, telecommunications portal hosts, and resellers. The telecommunications landscape is very dynamic, with multiple entry and exit points, which adds a great deal of complexity. Rapid technological developments and increasing market turbulence have added new dimensions to an already complex industry scenario. With all that complexity however, the industry can be simplified into five broad categories, from a value chain perspective, namely public network operators, backbone network operators, access network operators, service providers and intermediaries (Li & Whalley, 2002). This research paper adopts those broad categories, but narrows it further to the “telecommunications services industry”, which has been defined “as including only network operators and service providers but not hardware suppliers and media industry” (Li & Whalley, 2002) - that is the reference to the “telecommunications industry” or the “industry” in this paper.

The telecommunications industry in South Africa is made up of a few large and many smaller players, offering a range of diverse and ever-evolving business models (Armstrong, Cowan, & Vickers, 1994). Industry specialist researchers and analysts typically break the industry down into a broad functional categories of fixed network operators, mobile network operators (MNO) and various types of telecommunications service providers (Esselaar, Gillwald, Moyo, & Naidoo, 2007). Furthermore, there are numerous other industry players like content providers, wireless data providers, bulk service providers, usage facility providers - these are grouped under the heading of value added service (VAS) providers (Esselaar et al., 2007). The key players in the South African telecommunications industry are briefly described in the next sub-sections.

1.5.1.1 Fixed line operators

Fixed network telecommunications, while still a large part of the traditional business environment, has been well and truly eclipsed and surpassed by mobile telecommunications (Esselaar, Gillwald, & Stork, 2006) in South Africa. Telkom was the state-owned network provider of fixed line services until 2005, when its monopoly was broken with the licencing of Neotel as the second network operator (SNO) (SAGovernment, 2014). A smaller player offering mostly data services on both fixed and mobile platforms is Wireless Business Solutions (WBS).

1.5.1.2 Mobile network operators

On the wireless side, there are four mobile network operators in South Africa. Vodacom and MTN are currently the dominant ones – between the two operators they make up over 80% of the subscriber market share (Gillwald et al., 2012), while the smaller players are Cell C and Telkom Mobile. Virgin Mobile is another mobile network provider, although it does not own a network infrastructure but piggybacks on the other operators' networks, thus falling into a category known as mobile virtual network operator (MVNO).

1.5.1.3 Telecommunications service providers

The service providers are a large and critical part of the telecommunications value chain, providing the interface between the network operators and end-users. Using infrastructure capacity that they procure from the network operators, they typically sell network connectivity (like internet services and secure private communications networks), data services as well as voice capabilities to individual and business customers. Other than those that are owned and/or vertically integrated with the network operators, there are a few large independent service providers, most notably Altech AutoPage Cellular and Nashua Mobile, as well as those who focus more

specifically on data and internet services like MWeb, Internet Solutions and iBurst (WBS). There are also new entrants that have come up with innovative ways to repackage and resell wholesale network access and capacity, most notably Afrihost, Huge Group, and Vox telecom. Worth mentioning are other intermediaries who provide a channel to market for the network operators. These include numerous large and smaller retail businesses, informal entities, as well as other device and airtime resellers.

1.5.1.4 Carrier and Bulk capacity service providers

These are large industry players whose business is primarily to provide carrier infrastructure and capacity to the large network operators. The larger ones are Telkom, Internet Solutions providing IP based services, as well as the state-owned company that provides wholesale broadband capacity, Broadband InfraCo. Another player that emerged as a joint-venture between a few operators is FibreCo Telecommunications, which has already built over 2000km of national open-access fibre-optic network in South Africa, and plans to have 12 000 km in three years' time.

1.5.1.5 Regulatory Authorities

The first major effort at a coherent policy framework after the first democratic elections in 1994 in South Africa was the 1996 White Paper on Telecommunications. In terms of that White Paper two telecommunications regulators, the South African Telecommunications Regulatory Authority (SATRA) and the Universal Service and Access Agency of South Africa (USAASA) were formed. SATRA was established to regulate telecommunications and to manage the radio frequency spectrum, excluding the spectrum for the broadcasting services frequency bands which were then administered by the Independent Broadcasting Authority (IBA). USAASA's mandate was to promote the goals of universal access and universal service to

telecommunications services in South Africa. In 2000, SATRA and the IBA merged, and the new regulator, the Independent Communications Authority of South Africa (ICASA) was formed to perform the combined functions of the merged authorities.(SAGovernment, 2014). USAASA continued to exist and keep its mandate.

1.6 Structure of this research report

The next chapter deals with literature review and case studies pertaining to the research issue. This is broken down into the typical reasons for regulatory failure and the conditions necessary for the attainment of optimal outcomes. Prominent case studies and relevant reference sites around the world are referred to. Finally a set of propositions is developed which will be tested as part of the conclusions of this report.

Chapter three describes the methodology that is followed in the research, including the techniques for data collection and analysis. It concludes with the methods that are used to retain rigor in the research.

The fourth chapter delves into the detail of the results. The emergent themes are identified and detailed out using Grounded Theory techniques. In this, the use of narrative analysis and thematic analysis is implied. Fuzzy Cognitive Mapping is then applied to the data and the results and implications of the modelling exercise discussed.

The final chapter presents the conclusions drawn from this research, the recommendations that flow it, and suggestions for further research.

2 CHAPTER 2 – LITERATURE REVIEW

2.1 Introduction

The telecommunications industry has grown dramatically over the period of two decades since the democratic elections in South Africa. According to industry reports, the levels of consumer subscriber penetration for example passed the 100 percent mark in 2012 (www.businessstech.co.za), which suggests a well-connected society. However the policy outcomes for the sector have largely been poorly met.

The literature review in the next sections starts by focusing on the generic reasons for the industry failing to meet regulatory goals. Then the background and rationale for industry regulations is traced, and finally a review of range of regulatory objectives is examined.

The second part of the literature review focusses on finding the conditions, pre-requisites and imperatives for the improvement in the industry performance. This part is further broken down into the impacts of regulation on industry, then the industry stakeholder responses thereto are examined, before concluding with a search for the typical conditions necessary for the attainment of regulatory objectives through the policy and regulatory process.

2.2 Sub-problem 1 - Reasons for failure to meet regulatory objectives

2.2.1 Failure of regulatory policy and theoretical explanations

Despite expressed commitments to tackle the often-lamented high cost of telecommunications in South Africa, “the market remains structured around

vertically-integrated incumbents, some still significantly owned by the state, and ineffectually regulated in several critical areas, partially as a result of structural conflicts of interest in the institutional arrangements of the state” (Gillwald et al., 2012). This means that there are still monopolistic characteristics in the market, due to the state maintaining a significant ownership in the liberalised companies. This is certainly true in South Africa, as the state is still a 15 percent shareholder in Telkom and 25 percent shareholder in Vodacom as indicated in the latest (2013) annual reports of both companies. The real point being made here is that the Regulatory Authorities fail to promote competition within the telecommunications industry because of conflicting interests – they are both a player and referee at the same time within the industry, and thus do not drive the objectives with the requisite vigour and commitment.

Another consistent explanation for policy failure in the preponderant literature relates to the weaknesses of and impediments to the regulating authorities in developing countries in terms of skills, capacity, and other resources (Attenborough, Koch, Maiorano, & Miller, 2004). Due to these shortcomings, the incumbent operators are able to challenge, dominate and obstruct the regulators due to their ability to muster massive resources in litigation and research, while the regulators are often hamstrung by limited funding allocations from governments. This means the policy goals then get left almost entirely to the market forces and the commitment of the key players to “play fair”; they haven’t exactly played very fair in the case of South Africa, but have appeared to pursue very narrowly defined strategic goals of short term cost savings and profit targets.

The strategic importance of regulations varies significantly between the different layers of operators in the market. It is said that most regulations are targeted more at

the network operators than at the service providers or middlemen. Accordingly, the strategic consideration of regulations is also determined by the layer in which each key player plays. Literature coverage on the management of regulations offers some insights into how a range of responses ranging from passive acceptance to intense political lobbying can affect the achievement of regulatory objectives either negatively or positively (Shaffer, 1995). Christine Oliver further offers more types of potential industry responses, ranging from passive acquiescence, compromise, avoidance, to arrogant defiance and downright manipulation of the authorities (Oliver, 1991). It is said that the large operators fall more into the category of defiance and manipulation, including aggressive lobbying for their interests, and thus undermine what the regulators are trying to do. The smaller operators tend to fall within the more passive response categories (Olivier Boylaud, 2001).

Beyond those explanations, other reasons for the failure of policy relate to general economic factors and market forces. The key players tend to focus on driving their business cases and are thus unwilling to embark on projects that are likely to yield below a pre-determined level of returns. (Brue, 2011). In this regard, the elements at play for telecommunications businesses include the levels of industry competition, wholesale and retail prices, company profitability levels, levels of consistent investment in network infrastructure, and the number of players and potential new entrants in the market (Li & Whalley, 2002).

2.2.2 Theoretical rationale for the existence of regulations

Telecommunications is generally considered to be a public utility - an organisation that provides and/or maintains infrastructure and/or services for public service - along with others like electricity, gas (oil and gas) and water services (Armstrong et al., 1994). Public utilities, including telephone companies, generally emerged and

developed as state-owned monopoly organisations (Dyner & Larsen, 2001).

Monopolies are regarded as inherently inefficient, lacking the incentive to improve, while competition is regarded as the panacea for solving such inefficiencies through the laws of supply and demand (Dempsey, 1989). Excess profits attract new entrants in any industry, who must survive on the basis of a better offering and/or lower price, thus exerting downward pressure on pricing (M. Porter, 1979) while improving the quality of service and product offerings. The role of the regulatory authority in that situation is thus to facilitate and encourage such competition (Dempsey, 1989).

Furthermore, the public interest view of regulation holds that regulations are necessitated by “market failure, a growing demand for regulatory expertise as a *sine qua non* for efficient governance of the market, democratic politics as a safeguard of the public interest, and investors’ demand for credible investment regimes”(Hafeez, 2003). The increase in liberalisation aims to move from monopolies, to at least partly competitive industries (Dyner & Larsen, 2001; Leedy & Ormrod, 2005). State intervention in this regard is necessary because the market is unable to meet the developmental needs of the country on its own, while competition is still required to put pressure on large and entrenched incumbents to become more efficient (Esselaar et al., 2007). In South Africa up until 1993, that monopoly was today’s Telkom, having transitioned from the only telephone operator in the country – South African Post Office (Comninos, Esselaar, Gillwald, Moyo, & Naidoo, 2010).

It is thus evident from that literature that the reasons for regulation stem mainly from public-interest views, firstly to facilitate competition in the industry with the expectation that, as the capitalist theory postulates, increased competition will lead to the most efficient allocation of public resources to the broadest part of society in the most economic and effective manner (Brue, 2011). Secondly, regulation is

necessary because society needs to be guarded against potential self-serving actions of the industry incumbent operators. Finally, a very uniquely South African rationale for regulation derives from the rights-based approach: the regulatory objectives and principles of telecommunications policy are derived from rights in the South African Constitution (SAGovernment, 2014), specifically the right to “a secure, quality and affordable communications infrastructure and services” (SAGovernment, 2014).

2.2.3 Regulatory objectives in the telecommunications industry

The regulatory objectives as stated in the founding mandates of ICASA and USAASA are broad and varied, as they are intended to cover a wide spectrum of activities from telecommunications and information technology, to broadcasting and postal services. This paper focuses primarily only on the telecommunications sector regulations. According to World Bank research conducted by NERA (Attenborough et al., 2004), the most common regulatory objectives in telecommunications are the following:

- Create a favourable climate for promotion of investment to expand telecommunications networks
- Promote universal access to basic telecommunications services
- Prevent abuses of market power such as excessive pricing and anti-competitive behaviour by dominant firms
 - Foster competitive markets to promote efficient supply of telecommunications services, good quality of service, advanced services, and efficient prices
- Promote public confidence in telecommunications markets through transparent regulatory and licensing procedures

- Protect consumer rights, including privacy rights
- Promote increased telecommunications connectivity through efficient interconnection arrangements
- Optimise use of scarce resources such as radio spectrum, numbers and rights of way

In sub-Saharan African the most common objectives tend to be broadly related to three objectives, namely to promote universal access, create a favourable climate for investment, and ensure fair competition between operators (Attenborough et al., 2004). These are in line with the objectives articulated by Gillwald (Gillwald et al., 2012) who further adds pricing as a stand-alone objective to the list for emphasis. All of these constructs are in line with ICASA's telecommunications sector objectives, as stated in the ICASA Act 2000 (section 4).

It must be noted that reference to telecommunications policy in South Africa is usually couched under the three themes of universal access, good quality of service – being a reference to good user experience, and affordable prices. (Reporter, 2013; SAGovernment, 2014).

2.2.4 Research Proposition 1

The first research proposition is that the fundamental causes of poor regulatory outcomes in the telecommunications industry in South Africa relate primarily to three factors, namely the ineffectiveness of the industry Regulatory Authorities, the highly concentrated structure of the industry, and the narrow strategic framing of regulations as a critical input into business planning by key commercial industry players.

2.3 Sub-problem 2

2.3.1 The effects of regulation on society and companies

At a macro level, the movement by the state away from direct ownership and operational involvement in the telecommunications sector, to a role of policy determination and management has brought about increased competition (Esselaar et al., 2007). Deregulation results in new (telecommunications) entrants, which reduces the profitability of the industry for the incumbents (M. Porter, 1979), but which is good for the economy because new employment opportunities are created as demand for business facilities and infrastructure grows. In geographies where this regulatory role is effective, telecommunications has lifted large parts of society into the information age, precipitating a rise in the economic and social conditions beyond what was initially imagined. This is achieved through universal access, good technical coverage and reduced consumer prices (Cronin, Colleran, Herbert, & Lewitzky, 1993).

In South Africa however, the high wholesale prices are causing the retail prices to remain high, which continues to limit the business competitiveness in the services segment of the market , and also restricts access and customer usage of telecommunications at the retail level (Gillwald et al., 2012), which means regulation has not had the desired outcome of price reduction.

On the negative side, at a macro level deregulation has led to some businesses in the telecommunications value chain to be rendered obsolete due to the changing nature of the telecommunications value chain (Li & Whalley, 2002). Generally, job losses on a significant scale in many countries when utilities are privatised (Dyner & Larsen, 2001), and telecommunications is no exception.

2.3.2 Conditions necessary to achieve optimal outcomes from regulation

From a policy perspective, the bulk of literature focuses on the regulator, both on institutional arrangements and the executory capabilities of those regulatory institutions (Creswell, 1994). Various prescriptions of empowerment, skilling, independence and adequate resourcing for the regulator abound. Furthermore, coordinating and harmonizing the accountabilities and transparency amongst different statutory bodies is advanced as the main condition for achieving the policy objectives (Leedy & Ormrod, 2005).

From the company perspective, the McKinsey Quarterly Journal provides one model that summarizes the approaches in the literature for better industry performance. The model advances the view that companies need to incorporate three crucial dimensions into their strategic planning processes for the regulatory objectives to have any chance of being achieved. Firstly they need to diagnose the issues in the regulatory landscape and develop a heat map. Secondly they must understand other industry stakeholders and actively seek consensus with them. Lastly, companies must make the scanning of the regulatory environment a core and ongoing strategic function, accountable to the highest executive level in the organisation (Hennink, Hutter, & Bailey, 2010).

In South Africa, the company focus is still quite inward looking, seeking to serve the individual interests of the internal stakeholders, and making everything else become a by-product of, and coincidental to that internal goal. Shareholder primacy, that relentless prioritisation of the shareholder to near godly status, seems to be alive and well in the telecommunications industry in South Africa. This has also been observed in other countries as well. In the United Kingdom for instance, the evolution of the management of corporate governance has closely followed the shareholder primacy

route (Wen, 2013). According to Wen, “the Cadbury Report, explicitly emphasised the predominance of the principal-agent relationship (between shareholders and directors) in corporate operations and the shareholder primacy principle” (Wen, 2013 p.12). Unless the pressures driving the companies to adopt this obsession with shareholder returns to the exclusion of other stakeholders are identified and isolated, the goals of regulators are likely to remain elusive.

2.3.3 Research Proposition 2

By shifting their business approaches away from internal, short term focus to a proactive and informed dialogue with external stakeholders, custodians of company strategy can secure more sustainable returns for the telecommunications organisations, and concurrently help to drive better socio-economic outcomes for the industry, customers, and ultimately for the country.

2.4 Conclusion of literature review

The first part of literature review above, related to the first research sub-problem, dealt with the theoretical reasons for failure of regulations. This was found to be related to a number of issues, including the ineffectiveness of regulators, lack of competition, lobbying efforts that subvert the regulatory processes, and other market forces. The regulators role was found to exist precisely for the purpose of passing policy that catalyses the conditions for proper and effective competition in the market. From literature, the main regulatory goals were narrowed down to universal access, good quality of service and affordable prices for the customers.

The second research sub-problem, looking for theoretical options and solutions to the poor policy outcomes, looked at the positive and negative effects of regulations

on the general economy and the telecommunications industry in particular. The empowerment and proper capacitation of the regulator to pass relevant policy and to promote robust competition was identified as a critical precondition for good policy outcomes. Furthermore, a strategic shift by private companies within the industry towards a broader strategic framing of company objectives beyond the narrow shareholder focus, was identified as the other vital link to accompany the regulators' policy efforts.

From the literature review and analysis discussed, the following propositions were formulated.

2.4.1 Proposition 1:

The first research proposition is that the fundamental causes of poor regulatory outcomes in the telecommunications industry in South Africa relate primarily to three factors, namely the ineffectiveness of the industry Regulatory Authorities, the highly concentrated structure of the industry, and the narrow strategic framing of regulations as a critical input into business planning by key commercial industry players.

2.4.2 Proposition 2:

By shifting their business approaches away from internal, short term focus to a proactive and informed dialogue with external stakeholders, custodians of company strategy can secure more sustainable returns for the telecommunications organisations, and concurrently help to drive better socio-economic outcomes for the industry, customers, and ultimately for the country.

3 CHAPTER 3 – RESEARCH METHODOLOGY

3.1 Research paradigm

This study employs a qualitative research strategy to investigate subdued regulatory outcomes in the telecommunications industry in South Africa, and to explore some potential solutions. The most peculiar feature of qualitative research as a research strategy is that it allows the researcher to identify issues from the point of view of the study participants, and understand the meanings and interpretations they give to behaviour, events or objects (Hennink et al., 2010). This research seeks to discover the opinions and interpretations of key stakeholders regarding the reasons for low-key regulatory success in the telecommunications industry in South Africa, as well as views on potential solutions thereto. Some key features of qualitative research listed below (Leedy & Ormrod, 2005) are relevant and applicable to this research:

- The purpose of the study is to explore and understand the points of view of the participants
- The research process has the potential to reveal hidden perceptions and views
- There are multiple possible views about the same issue dependant on individual perspectives
- The sample size is relatively small

This topic is clearly subject to various interpretations and multiple opinions, and as such it meets that criterion of the qualitative strategy.

The approach used will be more interpretive and deductive, which means that the research aims to understand the issues, current and new, from the perspective of the study participants (Hennink et al., 2010), and to a lesser extent inductive, which

means looking for conformity of findings with pre-determined theory or models (Hennink et al., 2010). This is considered appropriate due to the dearth of objective data and recorded views, perceptions and business challenges faced by key telecommunications industry players in South Africa in this area.

3.2 Research Design

This research uses cross-sectional design to investigate the causes of, and potential antidotes to poor regulatory outcomes in the telecommunications industry in South Africa. According to Bryman (BusinessReport, 2014) cross-sectional design has the following distinctive features:

- More than one case. In this research, other than the Regulator, there were initially over ten industry players identified for research, with the intention of getting a good spread of opinion
- One point in time. This research was conducted over the last quarter of 2014, which assists with comparability due to the same set of regulatory context being maintained for all players during the research period.
- Quantifiable data. This is not a strong feature in qualitative research by definition, and this study is not intended to produce results in a quantifiable manner necessarily.
- Patterns of association. Inferences are drawn by examining relationships between the constructs and elements investigated

3.3 Population and sample

3.3.1 Population

The population for this research is all telecommunications sector players who provide fixed and mobile services and connectivity to business and to consumers. This entails mobile network operators, fixed line network providers, carrier and bulk providers of telephony capacity, and Mobile Virtual Network Operators such as Virgin Mobile. In addition, there are numerous forms of service providers (including Internet Service Providers), hybrid business models that provide some telecommunication services utilising the infrastructure of the network operators as a critical wholesale touch point e.g. Mr Price cellular and Pep Cellular. Finally, there is a multitude of various resellers and value add providers, as well as application providers. The telecommunications industry is replete with a host of hardware, software and content providers of all sorts, and is regularly evolving new business models (Li & Whalley, 2002).

3.3.2 Delimitations of the study

This research is limited to the effects of regulation on the mobile network operators, as well as connected telecommunications service providers. The latter category incorporates “value added” service providers like resellers and retailers of telecommunications products and services, as well as providers of other services that may utilize the infrastructure provided by mobile network operators. The following categories of telecommunications industry players and related regulations are not included in that scope:

- Fixed line network operators like Telkom, Neotel (fixed line divisions)

- Network infrastructure vendors – those who supply and install the network equipment infrastructure like Ericsson, Huawei, ZTE, Nokia Siemens, IntelSat
- The original equipment manufacturers for telecommunications devices (those who supply cell phone handsets, “tablets”, computers and other digital end-user equipment) like Apple, Samsung, Microsoft-Nokia
- Various forms of indirect wireless content providers, and software application developers and providers
- Radio broadcasting and television elements of telecommunications like SABC, MultiChoice DSTV, and satellite

These exclusions include both the hardware and software providers in each of the above-mentioned category.

3.3.3 Sample and sampling method

By their very nature, qualitative interviews are very time consuming and thus place practical limits to the number of participants that can be covered (Shaffer, 1995).

However, the sample accessed in this research is considered to be adequate as it included both the large mobile network operators and two of the three smaller ones, as well as four of the top six service providers in South Africa within the designated industry category of the research.

This research uses purposive sampling methodology. This means the choice of participants is deliberately chosen by the researcher “because of their relevance to the research questions” (BusinessReport, 2014 p. 418). That choice is driven by their knowledge, experience and authority to answer the research questions (Creswell, 1994). Only senior members of management were requested to

participate, based on their knowledge of the regulatory dynamics and effects within their organisations, and their privy to business strategy.

Furthermore, purposive sampling should also seek to achieve variety in the resulting sample, “so that sample members differ from one another in terms of key characteristics relevant to the research questions” (BusinessReport, 2014 p. 418). In this regard the organisations represented were carefully chosen on the basis of size (small or large players in terms of customer market share), predominant service focus (voice or data), and layer in industry (network operator or service provider). These differentiating characteristics are important because the effect of regulations impacts organisations in each groupings in significantly different ways, and their regulatory requirements are different.

Finally, the initial concern about the availability of the chosen key industry respondents was largely mollified by the positive response rate obtained, and this researcher believes that no significant additional data was missed by the non-availability of the few respondents.

The final sample and list of respondents is shown as *Table 1*.

Table 1: Interview respondents

(The respondents marked with an asterisk (*) are large operators in their sector, and those marked a hash (#) are smaller participants)

Institution	Telecommunications Sector	Main Business	Experience	Responsibility Area
MTN SA *	Network Operator and Service Provider - All	Voice / Data	over 15 years in industry in SA	Regulatory Management - MTN
MTN SA	Network Operator and Service Provider - All	Voice / Data	Over 15 years in industry in SA, Nigeria, Iran	Executive Management
MTN Group	Network Operator and Service Provider	Voice / Data	Over 15 years in industry in SA	Executive Management
Vodacom Group *	Network Operator and Service Provider - All	Voice / Data	Over 15 years in industry in SA	Regulatory Management - Vodacom
Cell C #	Network Operator and Service Provider - All	Voice / Data	Over 15 years in industry in SA Over 15 years in industry in SA	Regulatory Management - MTN Regulatory Management - MTN
Vox Telecoms #	Service Provider - SME/Corporate	Data	Over 15 years in industry in SA	Executive Management
Huge Telecoms #	Service Provider - SME /Corporate	Voice	Over 15 years in industry in SA	Executive Management
AfriHost (Pty) Ltd #	Service Provider - Consumer / SME	Data	Over 15 years in industry in SA	Executive Management
iBurst (WBS) #	Network Operator and Service Provider - Consumer and Business	Data	Over 15 years in industry in SA Over 15 years in industry in SA	Executive Management Executive Management
ICASA 1	Government / Regulator	N/A	Over 15 years in industry in SA	Counsellor - ICASA
ICASA 2	Government / Regulator	N/A	Over 15 years in industry in SA	Chief Executive Officer - ICASA
Telkom Mobile #	Network Operator and Service Provider	Voice and Data		
Nashua Mobile #	Service Provider (Reseller)	Voice and Data		
Virgin Mobile #	Virtual Network Operator (MVNO) and Service Provider	Voice and Data		

It must be noted that respondents from the same company interviewed together in the same sitting are counted as one respondent for results and analysis purposes due to the observed strong convergence of their opinions in that situation. However, respondents from the same organisation interviewed separately at different times are

counted as individual respondents because they tended to deal with issues independently and thus quite differently in many respects.

3.4 The research instrument

Interviews were used as the primary tool to collect information, aided by semi-structured interview guides; the interview guides evolved and were amended slightly with the progression of the research as more data and understanding came to the fore.

Semi-structured interview guides allow the researcher to probe and clarify, while avoiding “boxing” the respondents into a set of restrictive questions (BusinessReport, 2014). Many studies within the telecommunications industry have used indirect surveys or questionnaires, as well as publicly available archival data, with a few longitudinal case studies (Shaffer, 1995). With all that, insights and perceptions directly from commercial players in South Africa on ways to better achieve regulatory policy goals seem to be quite lightly documented, with more information yielded in short quotes and sound bites in the public press than in research literature. This made the interview method all the more appealing.

Furthermore, as pointed out by Bryman, the use of interviews allows for better information gathering when the core issues are not amenable to indirect research and passive analysis data (BusinessReport, 2014). This is particularly relevant in this research because of the confidentiality and therefore restricted external access to corporate strategies. Interviews provide the best solution to the problem of access (Shaffer, 1995).

Existing literature provides a guide of the type of questions that have been asked in questionnaires and surveys in this area of research. From the regulatory perspective,

the leading source of research questions is a 2004 research article by Attenborough and others, commissioned by the World Bank (Attenborough et al., 2004). This report details the data collection process and actual questionnaire than can and has been used to study regulatory effectiveness. From the business perspective, various sources of research questions are available, mostly dealing with enterprise strategy responses to regulations. Some research questions have been used in indirect surveys before, and others are suggested questions for future research in various journals. Prominent journal publications used in this regard are by Levi-Faur and Rozen Bachar (Bachar, 2011), Christine Oliver (Oliver, 1991) and Brian Shaffer (Shaffer, 1995).

From that literature, this research adapted and formulated a set of simple questions that are used to prompt the thoughts and discussions during the interviews. The primary focus of this research is to gain insights and possible new perspectives about the research questions. The questions are formulated to solicit responses that will deal directly with the research questions, the research sub-problems and the research propositions. It must be noted that the set of questions is used only to prompt the interviewee, as is the procedure with semi-structured interviews (Bryman, 2012). The semi-structured set of questions is attached to this report as *Appendix 1*.

3.5 Procedure for data collection

The interviews were conducted at the business premises of the respondents at times chosen by them during the month of October and November 2014. These were once off interviews, and no effort was made to have a secondary round thereof due to the difficulty of securing appointments with the Executive leadership in the industry.

Access to the key players was relatively easily obtained, facilitated through personal and professional relationships of the researcher. Access to the Regulator was also quite easily obtained, with keen participation by them.

Before the meetings, the researcher sent the respondents the information about the research topic and the purpose of the research. At the interview, respondents were given a brief overview of the research. As recommended by (Bryman, 2012) a consent form was also produced and the respondents requested to read it and, if comfortable to go ahead with the interview, to sign it. The consent form is attached as *Appendix 2*.

The researcher would then open the interview and proceed to ask questions in line with, but not always exactly, the prepared interview guides. Each conversation was recorded in its entirety with an electronic recording device. After each interview, the researcher proceeded to transcribe the interview into hard copies.

3.6 Data analysis and interpretation

3.6.1 Grounded theory

This research uses grounded theory as the primary strategy for data analysis.

Grounded theory is “a general methodology for developing theory that is grounded in data systematically gathered and analysed. Theory evolves during actual research, and it does this through continuous interplay between analysis and data collection” (Corbin & Strauss, 1994) p.273. According to Bryman (BusinessReport, 2014), central to grounded theory is the “coding” process. According to Charmaz (1983: 186), cited in Bryman (BusinessReport, 2014) p.568, this entails reviewing the interview transcripts, and giving labels (names) to component parts that seem to be of potential theoretical significance, and/or appear to be particularly salient”.

Charmaz (1983: 186), in the same citation further observes that “codes serve as shorthand devices to label, separate, compile, and organise data” (BusinessReport, 2014) p.568. Out of grounded theory analysis emerges concepts, categories, properties, hypotheses, and finally theory that epitomise the research data (BusinessReport, 2014).

This analysis approach is considered the most appropriate for this research primarily because there is very little that is known about the perceptions and opinions of key industry players in the telecommunications industry in South Africa regarding how they reason the regulatory environment objectives. It is also not very well known how they are set up to respond and interact with those regulations in their strategic frameworks. There is therefore no substantial body of knowledge in this area to hypothesize an upfront theory in South Africa; the results and analysis of the research will uncover the general consensus views or lack thereof with regard to regulatory effects on the industry.

According to Bryman, grounded theory is by far the most widely used framework for analysing qualitative research data (BusinessReport, 2014) p.567. That assertion is borne out by the high prevalence of grounded theory-based analyses into policy issues, including uses found within the telecommunications industry (Gerber & Teske, 2000; Hopper & Major, 2007; Pagani & Fine, 2008).

3.6.2 Fuzzy Cognitive Mapping

A secondary tool of analysis that is used in this research is the fuzzy cognitive mapping technique. Ross and Erasmus have submitted that fuzzy cognitive maps (FCMs) “... are a fast emerging tool that can be used to model relationships between concepts and determine the strength of impact of these relationships” (Ross & Erasmus, 2013) p.1. Fuzzy cognitive maps “are graph structures for representing

causal reasoning” (Bryman, 2012) page 65. The FCM graph depicts concepts and/or elements using nodes and lines; the causal links between the nodes are represented by arrows bearing a positive or negative sign and an assigned weighting on each arrow. Positive (+) means a causal increase and negative (-) indicates a causal decrease (Stylios & Groumpos, 1998).

FCM is suitable for mapping relationships that are imprecise, as is typical in qualitative research, hence the word “fuzzy” (Bryman, 2012). This quality, in particular, accords with this research due to the imprecise causal relationships between the regulatory policies, the business strategic reactions, and policy objectives, as well the interplay between those elements in the telecommunications industry. Furthermore, FCM allows for various scenarios to be created and assessed based on the different possible paths, impacts of and reactions between actions and outcomes (Bryman, 2012). This feature is of particular benefit to this research because as much as the Regulatory Authorities has a range of policy levers at their disposal, the key industry players have a range of responses and strategic options to choose from in relation to those regulations, and the causal connections between these variables can be well represented in FCMs. Lastly, as the regulatory environment is always in a state of evolution in the telecommunications, FCMs are flexible enough to capture future scenarios in “what-if” type analyses and scenario building (Bryman, 2012).

FCM has been applied efficaciously in the telecommunications industry. For example, research was conducted using this tool to analyse proposed strategies that could be employed by a network operator in order to maintain its competitive positioning in the over-the-top market environment (Ross & Erasmus, 2013). A version of FCM was also used successfully in Taiwan to evaluate 3G licensing

policies to be used as criteria to award licenses to bidding network operators (M. E. Porter, 1996).

3.7 Limitations of the research

A significant limitation in this research is that the interviews were held with current employees of the respondent organisations. This means that their impartiality and the level of frankness can be subject to some criticism. The wide spread of respondents and diverse mix of businesses in the final sample was nonetheless considered adequate for fair and balanced overall views to emerge from the respondents.

Another limitation is that interviews, by their very nature, are time consuming and thus place practical limits to the number of participants that can be covered (Shaffer, 1995). This researcher did set aside sufficient time and arranged enough access to do justice to the interviews. A variation of that limitation that issues raised in a late interview cannot be put to and tested on the earlier respondents because the occasion has passed. Unless the researcher has the time to conduct a secondary round of interviews, and the interviewees are available and willing to participate again, the opportunity to ask emergent questions is lost. That situation was experienced during this research, and its incidence is denoted in *Table 2* of the Results chapter, as well as the results summaries presented in that chapter under the heading “No view expressed”.

The rapid pace of change in the telecommunications industry can become an issue during research. Technology dynamics can cause issues that are of peripheral importance to suddenly become core issues in a short space of time, so priorities and weightings associated with objectives and outcomes can be volatile, and thus

change the research context. A case in point was the advent of the LTE technology in 2009, which brought about renewed urgency around spectrum allocation. This also disrupts strategic planning and practice for the businesses, and may bring an otherwise stable environment into disequilibrium. In the same vein, changes in market dynamics can turn an issue into a non-issue quickly, and potentially render some research findings obsolete. A new product or service launched by an operator or service provider can have an immediate effect on the main regulatory objectives. An example is the recent launch of shared data bundles by MTN SA, which has instantly addressed one of the most ubiquitous customer complaints regarding the expiry and loss of large data bundles with no option of at least transferring them to other users.

Finally, it must be noted that this research focused on the opinions of industry respondents, and thus no in-depth effort was put to unpacking legislation and amendments thereto. For example ECA of 2005 was the only legislation referred to, and the later amendments to the Act were not reviewed for significant changes and their policy implications.

3.8 Validity and reliability

“Validity and reliability are the technical terms that refer to the objectivity and credibility of research” (OECD, 2004). Alan Bryman describes validity as the concern with the integrity of the conclusions that are generated from a piece of research (BusinessReport, 2014), and reliability concerned with the question of “whether the results of a study are repeatable” (BusinessReport, 2014) p.46. However, he points out that there is no consensus on the applicability of those in qualitative research. That applicability concern is relevant for this research due to the difficulty of applying the validity and reliability criteria without modification. Accordingly, in order to assure

research quality and rigour, this research conforms more with the criteria proposed by Guba and Lincoln as cited in Bryman ((BusinessReport, 2014) p.390, namely trustworthiness and authenticity.

3.8.1 Trustworthiness

Sub-elements of trustworthiness are “credibility, transferability, dependability and confirmability” (BusinessReport, 2014) p.390.

3.8.1.1 Credibility

This is similar to internal validity, which refers to a match between observations and the theories developed from those observations. The credibility of the findings is established as suggested by Bryman by following the “canons of good practice” and having the interview recordings and transcripts available for review by anyone permitted to do so by the researcher, for confirmation that the researcher correctly understood the [responses]” (BusinessReport, 2014) p.390.

3.8.1.2 Transferability

This is similar to external validity, a criterion which implies that research findings can be generalised into other settings. In qualitative research, as noted by Creswell (Creswell, 1994), the focus is not to transfer the research findings to a generalised findings for the entire population, but rather to understand each research setting from its unique perspective and merit. This research provides for such understanding by the use of “thick descriptions”, which means providing a detailed account of the research process and the responses received, which assists users of the report to understand the circumstances under which the same research might be applied and the similar findings might hold (BusinessReport, 2014) p.391.

3.8.1.3 Dependability

This is a criterion that is similar to reliability, which entails research results are stable and repeatable (BusinessReport, 2014). The “auditing” approach as mentioned by Bryman, is used in this research to achieve this quality element. The auditing approach entails keeping a good record of all phases of the research and making them accessible for checking and confirming the rigor of process and the actuality of the findings used in getting to the research conclusions (BusinessReport, 2014). In this regard it is quite similar to the credibility element mentioned earlier.

3.8.1.4 Confirmability

Lastly, confirmability is concerned with ensuring that the researcher can be shown to have acted in good faith (BusinessReport, 2014). Again, this is achieved within the “auditing” approach mentioned above.

3.8.2 Authenticity

Further criteria for ensuring the robustness of the research are contained within the heading of authenticity. The most relevant element for this research is the sub-element of fairness. The question asked in this category is “whether the researcher’s findings fairly capture the viewpoints of all the respondents” (BusinessReport, 2014) p.392. Again it is submitted that a set of comprehensive and methodically kept records will provide an adequate basis to determine the extent to which the divergent inputs have been fairly represented.

4 PRESENTATION AND ANALYSIS OF RESULTS

Grounded theory techniques were applied to the research interview transcripts with a view to discerning the key themes from the respondents. Thematic analysis and narrative analysis methods were also used alternatingly and concurrently. The themes and sub-themes depicted in *Table 1* emerged from that data analysis process.

Table 2: Emergent themes and sub-themes

(Count is out of 9 commercial respondents i.e. unless specified, the Regulator respondents are excluded. The numerous sub-themes under some sections are not shown)

Theme and sub-theme
Regulations directly affecting organisations - Liberalisation regulations - Wholesale price regulations - Security related regulations - Universal access regulations
Regulations indirectly affecting organisations - Network infrastructure investment - Quality of Service - Facility access regulations (Local Loop Unbundling)
The role and place for regulations in the industry
Requirements/Suggestions to improve industry performance
Perceptions about the Regulator
Corporate structures for Management of Regulatory environment

4.1 Regulatory themes directly affecting the organisations

The respondents were first asked about the particular regulations that had a direct effect on their businesses, and whether that effect was positive or negative. Most of them cited pieces of regulation and legislation that can be grouped into four categories, namely liberalisation, wholesale pricing, security and crime prevention, and universal access regulations. Network investment, quality of service, and infrastructure sharing were mentioned as important but are relatively less intensely regulated.

A summary table is presented at the beginning of each element where relevant. These summary tables provide a tally of responses, and these are later used to construct the FCM nodes.

4.1.1 Liberalisation regulations - ECA

Policy objective	Responses	Positive effect	Negative effect	No opinion expressed / Not applicable
Opening up the market to new players and regulating for a modern industry	Consensus of views: • Network self-provisioning allowed • Service Provider sector established	7	0	2

The passing of the ECA in 2006 (ECA Act No.36 of 2005, gazetted in April 2006) was cited by most respondents as a major milestone in the history of the South African telecommunications evolution. In particular, they regarded the granting of the right to provide an own telecommunications network to any person in terms of the ECN licensing provisions, as well as the opening up of telecommunications service provision to more players in terms of ECNS licensing provisions, as the catalytic tools that the authorities deployed to unleash a modern and vibrant industry in South

Africa. *“This Act was the most positive and progressive piece of regulation, at least on paper, that would transform the course of the telecommunications industry in South Africa”*, explained one respondent. The service providers cited the ECA in particular as the primary legislative instrument in terms of which their very businesses were established. For instance, because service providers could now set up their own network infrastructure, VoIP services were established and grew rapidly in South Africa.

The importance of this piece of legislation is that it allowed new players to enter the market, both as network infrastructure providers and as service providers, ending decades of state monopoly in these areas. The barrier to entry into the telecommunications industry was thus instantly changed from institutionalised restrictions to commercial considerations. This had the effect of increasing competition in the industry and improving the telecommunications services provision in the country.

The ECA further provided wide-ranging powers to the Regulator that enabled ICASA to regulate, *inter alia*, interconnection, spectrum licensing, promote competition, as well as being able to impose a number of performance targets and obligations to the network and service provider licensees.

According to Genesis Consulting (www.genesis-analytics.com/sector-focus/communications.html, 2014), the telecommunications industry in South Africa has followed the typical transition path from state monopoly to a liberal licensing regime that has been seen in most other markets during the telecommunications liberalisation process.

However, Genesis Consulting further noted that the evolution is still far from complete:

“The liberalisation process has, however, been gradual, and the sector is still characterised by pockets of market power and therefore economic regulation... [D]evelopments, such as the licensing of a second national network operator Neotel, the enactment of the technology neutral Electronic Communications Act, and the licensing of additional firms for the provision of communications network infrastructure are indicative of an evolving market and extensive technological change.”

Most of the other regulations in the industry flow that Act, and the Regulator thus continues to have the critical responsibility of facilitating and enabling the improved performance of the telecommunications industry in South Africa.

4.1.2 Wholesale price regulations

Policy objective	Responses	Positive effect	Negative effect	No opinion expressed / Not applicable
Reduction of MTR to encourage the reduction of prices rates to the end user customers	No consensus of views: - Reduced the input cost and leads to lower retail prices - Not enough - Destroyed some sectors of the industry	7	2	0

The reduction of MTR by the Regulator in 2011, and then again in 2014 was considered by all nine respondents as positive. The service providers spoke of that positive effect within their businesses, while the network operators considered it as good for the customer and the country rather than for their businesses as such. All the respondents stated that the drop in MTR caused a reduction in the cost floor for offering services to the consumer, with wholesale pricing being the biggest input into

the retail pricing. This they say was the best possible benefit for the man in the street.

Even so, there were some reservations about whether the Regulator has set the latest MTR reduction glide path of 20c – 16c -13c over the three year period 2014/15 – 2015/16 – 2016/17 respectively at the “correct” levels. Three respondents felt that the reduction was too aggressive and too quick, and might lead to unintended consequences in the industry. Overall though, the predominant view is that the Regulator has done a good job on the MTRs for the ultimate consumer.

Two respondents, although generally in agreement with the positive effects of the MTR reduction mentioned above, expressed an extreme view that there should not be any interconnect charge between the operators at all, and that the rate should go down to zero. They saw the glide path regulations as “a step in the right direction” but not enough. According to this view, any interconnection charges are artificial and distort the market. On that basis, these responses were classified as negative in the summary table above.

Three of the respondents pointed to the initial negative effects of wholesale price reduction. A historical account was narrated to elaborate on this response:

Before the passing the ECA I 2006, three factors in the South African telecommunications industry conspired to create a niche segment of telecommunications businesses. These were:

- The MTR that was effective in South Africa was R1.25c per minute
- Voice calls to overseas destinations cost upwards of R3 per minute
- Telkom was the only ISP allowed to operate in South Africa

Early entrants into the telecommunications space used sophisticated technologies to take advantage of these factors, and set up services such as Call Back, Call Through and Least Cost Routing services. These services essentially used technology to undercut the high cost to overseas destinations while receiving a high MTR from the operators. The provision of these services grew remarkably and became a significant segment within the industry. According to one respondent who was in that business, *“we were making revenue of R1.5 billion a month on these services.”* The reduction of the MTR, in 2011 and then in 2014, was a major factor in the total collapse of that entire segment of the industry – the business case for the niche business models was completely obliterated. *“It [the reduction of MTR] took businesses like ours out of the equation at that time, we had to learn to become a proper Telco which is much harder.”* was the comment by one affected respondent. It resulted in the loss of revenue, jobs and closure of downstream suppliers. The respondent mentioned that this price reduction was the main reason their company eventually delisting from the JSE.

Another negative effect that was spoken about was the reduction of the incentives – connection incentives and bonuses – which were very large payments to distribution channels by the network operators as a direct result of the loss of MTR revenue; the purse was reduced. The respondent explained, *“...in moving the [MTR] rates down, it had an impact on our ultimate suppliers, which are the mobile network companies. So in order [for them] to recover or recoup some of the margin they were losing by a falling mobile termination market, they sought to withdraw margin to the industry downstream.”* This is said to have caused the reseller service provider business model to be less attractive. The exit of Nashua Mobile from telecommunications in 2014 (BusinessReport, 2014) was quoted as an example, with other similar business

thought to be operating on the edges of profitability and expected to fold sooner or later.

Finally, two respondents explained that the high interconnect rates enabled the network operators to drive the subsidisation of cell phone handset through the connection incentives paid to the distribution channels. This in turn contributed to the remarkably high cell phone device penetration and technology adoption that was reached in South Africa in the early years of mobile communication, both in the prepaid and post-paid markets.

With the historical account addressed, the respondents felt that the current position is a lot more predictable, which helps them to put measures in place to better sustain their business models. Notwithstanding the negative effects in the early years, the effect of MTR regulations was seen as net-positive by the industry.

From the Regulator's perspective, once the operators started to pass the benefits of wholesale price reductions through to the retail pricing, good robust price-based competition in the market ensued, with the third network operator Cell C taking the lead in shaking the market in 2012/13. This in turn resulted in further price drops and very attractive promotional offerings for the end-user. On the overall therefore, there is good evidence to suggest that the reduction of MTR had the desired effect, which is to reduce the cost to communicate in South Africa.

What the Regulator will do in 2018 when the current glide path is completed will again put the Regulator in the spotlight. The options are to leave the MTR at the final target rate of 13 cents, to reduce it further as some of the respondents appealed, or go the other way and raise it to allow some room for margin increases as per the implied wishes of some. Either way, the process-related lessons learnt from the MTR legal battles of 2014 must be remembered at that time.

4.1.3 Crime and security-related regulations

Theme	Responses	Positive effect	Negative effect	No opinion expressed / Not applicable
Cost of implementing regulations	Consensus of views: • Set-up and ongoing compliance cost is high • Slowdown in customer acquisition affected growth	0	7	2

All the seven affected respondents cited the passing RICA in 2002 as one of the most impactful regulations to affecting telecommunications. These are the respondents that supply SIM card-based services in particular; they reported that they were affected in two respects. The first was the high cost of implementing the regulations, and the second was the slowdown in customer acquisition.

4.1.3.1 High cost of implementation

The 6 respondents cited the following as direct costs of RICA implementation:

- Business analysis and process changes
- Development of management systems
- Hardware acquisitions for record keeping and archiving
- Human resources for ongoing operational management, customer on boarding query resolutions, and Law Enforcement Agency costs
- The company contributions to the RICA company that was formed in terms of the legislation

The two large network operators estimated that the set-up costs alone were over R500 million respectively, and the ongoing RICA-related administration costs can be as high as R15 million per annum.

4.1.3.2 Slowdown in customer acquisition

The service providers also mentioned the slowdown in customer acquisitions as the most negative effect on an ongoing basis. The challenges that were experienced in this regard relate to the following factors:

- Existing customers that did not have the required documentation at hand had to be disconnected from the networks by the cut-off date. In this regard MTN and Vodacom were estimated to have had to cut-off up about 2 million customers from their networks by the deadline of 30 June 2011(A.Goldstuck, 2011).
- Potential new customers could not be on boarded unless they produced the documents. One respondent noted,

“...as you know we have a large population of non-South Africans in the country, many of whom may or may not be legally here and thus have no documents. This is apart from the South Africans who do not have an ID document or can’t produce a personal form of proof of residence. The latter have to go to a local authority, like a chief or a police station, to get an affidavit confirming that they resided in the general locality under the jurisdiction and service of that local authority. That process can take anything from a week to a few months in some cases. That’s how long it will take us to acquire that customer, compared to same time in-store customer acquisition in the past”.

The effect was a significant reduction in business growth for all the companies affected. Another respondent remarked that “...*in one stroke of a [regulator’s] pen,*

we had to change our business plans completely, reduce our revenue forecasts, increase our operational expenditures, and take a drop in operating profit margins.”

RICA type legislation has been implemented in a number of countries before and after South Africa with similar effects as stated above. Zimbabwe implemented it before South Africa, and Ghana, Nigeria, Ivory Coast and Liberia after (BalancingAct, 2011). Following the SIM cards registration process, the number of mobile subscribers went down by over 2 million in Zimbabwe. All SIM cards registrations exercises in African countries resulted in an immediate decrease in the number of mobile subscribers (BalancingAct, 2011).

The implementation of security related requirements on telecommunications operators has become a worldwide practise with the ever present threats of crime, and growing terrorism and extremism, these regulations can only become more stringent rather than lenient.

The Regulatory Authorities could consider options to lessen the burden of implementation costs of these regulations. One option would be to allow the deduction of some elements of such costs from one of the financial obligations like license fees.

4.1.4 Universal Access to telecommunications services and connectivity

Policy objective	Responses	Positive effect	Negative effect	No opinion expressed / Not applicable
Achieving ubiquitous access to mobile telephone services for the citizens	No consensus of views: • CST program successful, but limited • USO good but not equitable • USAF effect not visible	7	2	0

Regulations affecting access mentioned were the erstwhile community service telephone (CST) program, which entailed providing public access voice telephony to “underserviced areas”. According to three respondents, that program was important in two critical respects. Firstly it brought telephony to those that could not afford the high mobile rates at that time and also could not afford to own a cell phone handset. Secondly, and more importantly from a business growth perspective, it created the practical awareness of use and benefit mobile telephony, and the consequent adoption of the technology on the part of those consumers. Furthermore, that program provided business opportunities to the network operators as well as small business entrepreneurs who owned the public phone equipment which were often constructed in modified shipping containers. However, the significant reduction of voice call rates over time, in no small measure due to the wholesale price reduction discussed above, as well as the increased penetration of handset phone devices into the low end of the market, virtually destroyed that market. While this was driven by positive market forces, it did have negative consequences for the small public phone entrepreneurs.

The network operator respondents also mentioned the Universal Service Obligation (USO) and Universal Service and Access Fund (USAF) in the access category. In terms of the USO, license holders were given some network rollout obligations to fulfil, notably to provide internet connectivity to a given number of schools and/or other public facilities. The USAF requires the license holders to make financial contributions to a fund that is meant to be used for broadening access to the poor and under-serviced areas. The four network operator respondents stated that they have indeed met all their USO obligations, and are regularly making the required contributions to the USAF.

With regard to the USO, the two smaller operators reported some unhappiness about the disparity of the obligations. They said that they were given the same absolute connectivity targets as the larger operators, which they say is unfair. They expressed preference for proportionate, size-based obligations for the operators as a fairer regulatory regime.

An interesting view that came from a few respondents was that the network operators have deliberately avoided to roll out network to the outlying areas even though there was a viable market there, preferring rather to concentrate their network coverage efforts in the metropolitan and the more affluent urban areas. This view was expressed forcefully, that even when specifically asked to bid for a USAASA (via the USAF) funded rollout project in the rural communities, the large operators are not interested and they often don't bid. An example cited for was in the rural districts of Joe Morolong and Ratlou in the Northern Cape and North West respectively; MTN and Vodacom are said to have simply overlooked the invitation to tender for a USAASA grant to deploy a network in those areas. *"This says a lot about their commitment to extending connectivity access"*, concluded this respondent.

The large operators retorted that all their network rollouts are driven by commercial business cases. Said one respondent *"To put up a BTS which just works for a few villages and [where] the inhabitants are limited is very expensive and unprofitable...if the regulator wants to do that then they need to also support the operator with some sort of subsidy, if they decide to put up a BTS in an unprofitable place, then they must also bring their share."* While this makes sense from a commercial point of view, the allegation that they don't bid even when there is such a subsidy was not answered convincingly. USAASA, together with the Regulator could thus look at

other ways of encouraging participation in this regard if the objective of broadening access is to be pursued cost effectively.

The network operator respondents further noted that access to telephony is a function of network deployment, as well as device penetration. With regard to the former (network deployment), the two large network operators report between 98% and 99% population coverage for voice telephony, and at least 30% data coverage across the country. It is not clear whether the Regulator can confirm these figures. What could be questioned here is more the capacity and quality of the network that is deployed in those outlying areas.

Regarding the device penetration, the large operators responded that they have been reducing the cost of access. Said one respondent, *“We have brought in highly data [internet] capable smartphones that cost under R1, 000 per unit, making it increasingly affordable to a larger segment of the poor population to own one and significantly reducing the entry barrier into the information age.”*

Finally, it is worth restating here that achieving ubiquitous access to mobile services for citizens is a major regulatory objective in South Africa, as in most other countries. Mobile services are a key enabler of socio-economic empowerment and development, and that connection has been proven in many studies. Regrettably, the network operators work on short term profit forecasts and don't focus on the developmental objectives. The USAF has also not made a visible difference in extending access to the marginal areas thus far. Some industry players internationally are of the view that “Governments should phase out universal service funds and discontinue collecting USF levies. Existing monies should be returned to operators and used to extend mobile services to remote areas.” (GSMA, 2013 p 79). As demonstrated above, balancing the private sector “business case” driven criteria

and the country's commitment to provide access to the digital connectivity is a challenging task for the Regulatory Authorities, and thus requires extremely careful but ongoing consideration by the Regulator.

4.2 Other Indirect Regulatory aspects

4.2.1 Network Infrastructure Investment and Innovation

Policy objective	Responses	Positive effect	Negative effect	No opinion expressed / Not applicable
Encouraging network infrastructure investment and innovation	Consensus of views: Business climate (uncertainty) not conducive to long term commitments	0	7	2

Many respondents expressed the view that the business environment has to be conducive for network operators in order for continued investment to take place, and their view is that this is not the case in South Africa at the present time. In particular, their major concern is the lack of direction on a number of critical issues that form the basis for long term investment planning. Those issues are discussed under the “regulatory uncertainty” section (section 4.4.2) of this report.

What is clear is that the network operators, as is the case with investors in other industries, require an environment that provides incentives to invest and innovate, or at least one that does not put up hurdles and disincentives. All respondents were very clear that investment is driven by business case. One respondent put it thus, “... *network capacity requires huge investments, and investment requires a climate that says you are going to get a [very] good return. Unfortunately that's the capitalist system - capital goes to where it gets the highest return for the risk that it's taking.*”

In spite of that unease, the operators have shown faith in South Africa thus far. The two large network respondents stated that they have between 98% and 99% population coverage in South Africa on voice, and are currently between 30% and 60% on data coverage. They emphasised that they have invested heavily in order to achieve those voice coverage rates, and are similarly in an ongoing process of doing so on data networks. One respondent said “...*we are not ashamed of our networks, even when you compare us to the first world countries*”. However, they made the point that the data business case is “*very difficult*”, requiring a large investment in a highly competitive environment where prices are dropping rapidly. To this point, the smaller operators added that “...*it is unlikely that the capital invested [in the data networks] will be recovered.*” This accords with experiences in Europe where research showed that “*network operators’ investment accounted for 70% of the total ecosystem investment in 2006 and 2011 but, for the same years, free cash flow fell from 57% to 48%, under half of the ecosystem total.*” (GSMA, p32).

Aligning the expectations of investment and innovation by the network operators with their profit expectations is something that the Regulator will have to consider carefully.

4.2.2 Quality of Service

Policy objective	Responses	Positive effect	Negative effect	No opinion expressed / Not applicable
Allocation of high frequency spectrum and digital dividend	Consensus of views: Delayed and having a very big negative effect on the Investment planning, Quality of data service, as well as expansion	0	9	0

	of access to outlying areas			
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All the respondents claimed they are doing their best to provide the highest quality of service within their given resources. With regard to user experience on the networks and services during voice calls or data sessions, the narrative that emerged is that the biggest impediment is delayed issuing of the 2.6 GHz frequency by the Regulator, which is the best frequency spectrum for high speed delivery on high quality content. In addition the so called Digital Dividend, which is the best spectrum for wide area coverage and signal propagation, has also not been made available. These delays have hamstrung the ability of the network operators to significantly improve on the quality of service at a reasonable capital outlay, particularly with regard to mobile data services.

As a short term measure, the network operators say that they have implemented a technique called “re-farming” of existing voice spectrum in order to rollout their LTE networks – the high speed networks currently under construction. However, that also has a downside: beyond a certain utilisation threshold this technique is said to put the quality of voice calls at risk, hence it is regarded as an interim, limited initiative.

The quality of service is closely related to the state of the physical network. The starting point is that an operator needs to rollout a network that provides sufficient coverage (geographic and/or population coverage) and capacity that is capable of accommodating the digital traffic generated by their customers, both outgoing and incoming traffic. There is ample anecdotal evidence at least, that many South Africans are not happy with the quality of service; a cursory scan of social media platforms like “HeloPeter” will confirm that. The lack of suitable spectrum has provided a plausible explanation why there is not sufficient investment in the

network, and thus the quality of service being relatively poor. In addition, as noted above under Network Infrastructure Investment in 4.2.1, network operators have noted that investment is also determined by the business case for investment. It is thus evident that there are two requisites for the achievement of the quality of service objective, namely the release of the 2.6GHz and 800MHz spectrum, as well as the determination by the network operators that there is a reasonable prospect for a good return on network investment.

There are other aspects of quality of service, namely the resources that companies put in their support functions like call centres and service centres, as well as the quality of the device that is being used by the customer. These are clearly of secondary importance to the technical aspects of the network. The mounting complaints about the quality of calls and unpleasant data experience on the Cell C networks as that operator gains more users on the back of cheap offerings are a good example this phenomenon. The Regulator thus a critical role to play in enabling the network operators to improve network quality, or at the very least to eliminate spectrum unavailability as an alibi for not rolling out sufficient network.

4.2.3 Last mile liberalisation

Policy objective	Responses	Positive effect	Negative effect	No opinion expressed / Not applicable
Opening up access to last mile / local loop unbundling	Consensus of views: • Good for competition	4	0	5

Four service provider respondents mentioned LLU as an important step in opening up access to the telecommunications networks in South Africa, and expressed frustration that it has not yet been implemented by the Regulator. They mentioned

that the policy to implement LLU was already approved in 2006 by then Minister of Communications Dr Ivy Matsepe-Cassaburi. The delay, they argue, has prevented them from accessing more customers and offering their services directly to the customers due to Telkom's monopoly over the fixed line network into the customers' business premises and homes.

The mobile network operators have argued that they do not operate a physical last mile since they use their base station towers as the last mile, and so the LLU regulations are not applicable to them. However, they would also like to provide end user solutions through fixed line connectivity, and thus they are also interested in fixed local loop unbundling. So, the delays in finalising the regulations in this regard is a source of frustration to mobile network operators as well as "the industry middlemen" - the service providers.

Apart from Telkom, all operators of physical cable, whether fibre, copper or coaxial will be affected by the regulation. This includes the fibre network rings that have been deployed by the mobile operators along selected routes in the metropolitan areas, and between certain towns and cities around the country. The metropolitan city councils are also at various stages of rolling out limited telecommunications networks within their localities. The unbundling of these will also be affected by LLU regulations.

The Regulator is acutely aware of the importance of LLU, but have expressed a dilemma of choices that they have to make:

"...the direct impact of the introduction of LLU for access seekers is a reduction in input costs in the provision of retail services to their own customer base. The indirect effects are expected to be both an improvement in quality of service experienced by the end-user and more choice in service providers as well as reduced end-user prices. The direct impact of the

introduction of LLU for the access provider is a disruption in current business models, which require time to be adjusted, particularly when taking into account employment concerns and network investment decisions.” (www.lcasa.org, accessed 14 Jan 2015).

This means one of the considerations for the implementation is the impact of new players on Telkom and the other owner of infrastructure, the implications of which the Regulator will clearly have to take into account.

Access to the last mile by any operator who is able and willing to use it is clearly good for stimulating competition. However, a significant barrier to entry into that competitive space the cost of putting up other infrastructure to bundle, direct, control and manage data traffic at the customer premises. Furthermore, the opening up of LLU at a wholesale level is also fraught with risks of “cherry picking”, whereby service providers only choose the few high potential income areas, and leave the rest under-served. Even so, LLU will no doubt open up more retail opportunities, encourage innovative product offerings, and ultimately will unlock more value for the end user customers.

LLU has become mandatory for all network rollouts in many parts of the world, although there are a few places where this policy instrument is still under development and/or consideration.

4.3 The essentials of regulations

4.3.1 The place for regulation – promoting orderly competition

Theme	Responses	Positive effect	Negative effect	No opinion expressed / Not applicable
Regulations are important, useful, necessary	Consensus of views: • Must be aimed at promoting competition and	9	0	0

	- rectifying externalities • Cautioned against too much interference			
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All the respondents shared the view that there is an important role for the Regulatory Authorities to play in the telecommunications industry in South Africa. The general consensus of opinion is that the overriding purpose of regulations should be to create and/or promote competition in the market. However, the respondents' views of how the Regulatory Authorities should encourage competition and how best to promote it were wide and varied, and are discussed in the next section of this report. For now it is worth noting that six respondents said that the Regulator has not done enough to promote competition in the industry, two felt that they have not done the right things, while one respondent felt that they have done too much and "...*should only provide guidelines not regulations*". There were two clear "camps" of opinion based on the size of the players, as well as the layer of operations in the industry which the respondents play in.

In the one camp, the large network operators tended to focus on the regulations that are desirable at a technical level, but not at an operational level. An example cited was for the Regulator to allocate the frequency spectrum to enable them to build their 3G and 4G data networks. Their general view is that the large players are the ones that have the deep pockets to invest in the network infrastructure for the benefit of the country. The authorities should regulate in a way that allows them to get on with their businesses and get attractive returns that make it worthwhile to continue to invest. One respondent expressed this sentiment thus, "*I think that...regulators are becoming more and more aware that if they make the environment too unattractive for investment, you start to harm what the country is trying to achieve – never mind*

what certain industries are trying to achieve.” These respondents believe that the Regulator has not done the right things.

In the other camp, the smaller network operators and most of the service providers are of the view that the Regulator has not done enough to promote competition.

Firstly, a strong view emerged about the characteristics of the South African industry. Some branded the industry as an “oligopoly”, and others went further to describe it as a “duopoly”. The theatre of regulations to support competition, this group believes, should be broader than technical measures, but should also be directed at operational aspects as well. Reflecting on the regulatory activity before the first major MTR regulations in 2011, one respondent said, “...*they pass[ed] regulations every now and again, but there was nothing meaningful that the regulator actually sat down and said ‘how do we make competition actually work in this country’.* There were no meaningful market studies to look and see whether there was proper competition... competition does bring down prices, in fact in our view it’s the only thing that does that.” The issue of dominant players and their behaviour featured prominently in this area, and that they are protective of their dominant position and will fight way very strongly to keep it that way “...*and the Regulator has not done enough to change the anti-competitive status quo*”, lamented one respondent.

The lamentation for the perceived lack of proper competition was traced back to 1993/94 when the mobile phone industry was born in South Africa. “*They [the authorities] created the problem by issuing only two licenses in the first place. And then nearly 10 years later then issue[d] one more...*” commented another. He asked further “...*how do you expect a new entrant to get anywhere when you’ve got people who’ve had a 7 year head start? They’ve got massive [customer] bases, great*

[telecommunications] networks, they've tied up all the distribution channels...unless you help them on the regulatory front!?"

The general view shared by respondents about the virtues of competition and market forces has a strong basis in economic literature, from the famous Adam Smith's "invisible hand" cited in van Rensburg and Brue (Brue, 2011) to more modern writers. According to van Rensburg et al (Brue, 2011 p.37) for instance, *"...competition is the regulatory mechanism of the market system, [and] the market system itself is the organising and coordinating mechanism. It is an elaborate communication network through which in-numerable individual free choices are recorded, summarized and balanced"*.

Other countries are also very alert to any practices or tendencies that restrict competition. For instance SUBTEL, the Chilean regulator equivalent of ICASA, points very clearly in their website (www.subtel.gob.cl) that "the market is the best mechanism for allocating resources and that the state should only intervene where there is natural monopoly, externalities, or other market imperfections that might...lead to a sub-optimal allocation of resources."

The South African (mobile) telecommunications industry is indeed dominated by two very large players, MTN and Vodacom. Between the two of them they own around 80% of customer market share and around 90% of Revenue market share. Under such overwhelming numbers, it is difficult to dispute the assertion that there is indeed an oligopolistic market, and that there is near complete dominance by these two players. Oligopolies, like duopolies and monopolies in any industry are generally considered harmful to competition. Their main characteristic is that their dominance makes them unresponsive to the normal market driven incentives to be efficient and effective. Furthermore, and of more concern to the Regulatory Authorities they

typically foreclose other smaller players and potential new entrants by using their dominant power. For example, it is openly spoken about in the telecommunications industry in South Africa that the two large network operators deliberately increased the MTR during the licensing of the 3rd mobile operator, Cell C, from less than 40c to R1,20c per minute. Most of the respondents in this research argued that this was done in order to make it impossible for Cell C to offer retail rates that were more attractive than them, and thus struggle to get off the ground. One respondent elaborated further *“Because termination rates were high, cross net calls to players who dominate the market could not be charged below R1,20c. That interconnect cost is the minimum price you can charge, and this is before putting any recovery of your running costs plus any margin....”* It’s that kind of market failure therefore that requires a strong and determined regulatory authority to make interventions that adjust and calibrate the much vaunted “invisible hand”.

4.3.2 Improving the industry performance

The respondents provided a number of suggested interventions that in their views are required in the South African context to improve the performance of the industry in terms of the policy objectives. Upon analysis, these were classified into two groups, namely direct interventions and indirect interventions. These are discussed in the next sections of this report.

4.3.2.1 Indirect interventions to promote competition

Indirect interventions are those measures that do not touch the retail space i.e. will not directly impact on the end-user customer. They are essentially input side measures aimed at the wholesale suppliers of telecommunications services.

4.3.2.1.1 Supporting the smaller operators and/or new entrants

The first category that emerged under this theme was that the regulator needs to provide support to smaller players and/or potential new players. The following measures were suggested by different respondents with varying degrees of consensus, importance and urgency. Without such support, the smaller operators argued that *“it makes it very challenging to become sustainable in the South African market.”* There are a number of levers that were mentioned that are at the disposal of the Regulator and other Regulatory Authorities in this regard, the most prominent of which are reported and analysed in the following sections.

4.3.2.1.2 Asymmetrical interconnect rates

Policy objective	Responses	Supported	Not supported	No opinion expressed / Not applicable
To support their financial sustainability, the new entrants pay the incumbents a lower rate than they receive from them for interconnection traffic	No consensus of views: • 3rd Operator has been in the market for too long, they have not performed due to their strategic issues • Smaller operators never had a chance to take off all along	5	3	1

The smaller network operators reasoned that asymmetrical interconnect rates are critical to support any new entrant to get off the ground. Most service provider players interviewed concurred that this is necessary to support the smaller players. The large players also accept that asymmetry as a principle is fair to allow a new entrant to achieve some sustainability. But there the agreement ends!

In the specific context of South Africa, three respondents expressed complete disagreement for the award of significant asymmetrical rates to the 3rd mobile operator in 2011. The Regulator awarded an even bigger rate in the March 2014 regulations; asymmetrical interconnect rates are awarded at the sole discretion of the Regulator. This was vigorously opposed by the large operators in protracted litigation through most of 2014. *“How someone can say we are new after 10 years is beyond me. You’re not new after 10 years. In fact...Telkom Mobile deserve asymmetry, because they were new in the market. But not Cell C. How does an operator that’s got 16 million customers...be classified as a recipient of asymmetry after 13 years of operation!!!”* argued one respondent passionately.

On the support side, the smaller operators unsurprisingly shared a view that the asymmetry is a particularly potent tool to level the playing field. They argue that the Regulator took very long to give them the asymmetrical rates, and it may even be too late because the two large operators are too entrenched in their market domination. Their market lead may be unassailable.

There is indeed good precedent for awarding asymmetrical interconnect rates in favour of smaller operators in South Africa. MTN and Vodacom were the first beneficiaries of an asymmetry regime: they negotiated and received a very significant asymmetrical termination rate vis-à-vis Telkom in their early days, and that is believed to have greatly assisted them in building their businesses. At the time, the projections for mobile cellular phones were extremely low, so Telkom likely didn’t think they were giving away anything in those early days. However, the spectacular success of those companies must have surprised everyone, not least Telkom. By that time, the interconnect income of the operators was helping them enormously in their growth.

Curiously, there was no similar asymmetrical rates arrangements to benefit the 3rd mobile operator when it was licensed. Instead quite the opposite happened: the termination rate was increased to R1,25c by agreement between MTN and Vodacom, to the detriment of Cell C. By 2011 when the first asymmetry rates were regulated, Cell C was already struggling to take off. It may well be that there were other strategic shortcomings that led to their difficult situation, but there is not much doubt that they would have benefited from this regulatory tool had it been implemented earlier.

Unequal interconnection rates are a very strong and powerful tool at the disposal of the regulators. A number of countries have used it to good effect, including Chile and Uganda (elibrary.worldbank.org). The Regulator can learn lessons about the effects that those regulatory regimes achieved in those countries.

4.3.2.1.3 National Roaming agreements

Policy objective	Responses	Supported	Not supported	No opinion expressed / Not applicable
To provide quick access to a functional network for a new entrant	No consensus of views: • Akin to interconnect, should be similarly regulated • Leave it to negotiation between operators	3	3	3

National roaming regulations were suggested by three respondents. Their rationale was aptly summarized by one of them: *“National roaming is a species of interconnection, its conceptually similar...essentially you’re just carrying calls on another network. But the pricing discrepancy between the two [national roaming and interconnect rates] is massive in South Africa...the regulator could do a lot by*

regulating some form of national roaming to make it attractive to operators [entrants] that want it..."

The opposing views are simply based on the principles of free market. *"Why dabble into that space for heaven's sake, this is purely commercial transactions whose terms should be left to the parties involved to manage, including rates...surely the regulator has much bigger fish to fry!"*

There is a good argument for national roaming regulation, keeping in mind the cost and time it takes to establish a mobile telecommunications business. The process to establish a mobile telecommunications network is that an entrant gets a license to operate a network, then they must physically build a network. They cannot trade while they are building the network, because you need a large coverage area before you can say you have a viable network. Only when they have a reasonable amount of network coverage can they start signing up customers. This process is very expensive in terms of upfront capital investment, and quite long in terms of time-to-market.

Network roaming mitigates both the high upfront investment and time-to-market challenges because the new entrant can roam on an established network of an incumbent and sign up customers immediately while they build their own network in parallel. However, if the roaming rates are exorbitant, that may emasculate the new entrant and render their entry ineffective anyway. . Accordingly, an argument can be made for the regulation of network roaming to be supplemented by a "rate ceiling" regulation - something that is akin to the interconnect regulation. Such quick market entry would not only assist the new player to get a foothold in the market, but may provide valuable cash flows for their own rollout as well. Such measures are ultimately good to promote competition in the industry and the market.

4.3.2.1.4 MVNO

Policy objective	Responses	Supported	Not supported	No opinion expressed / Not applicable
To facilitate access to existing network(s) for MNVO	No consensus of views: • Similar to national roaming, should be similarly regulated • Leave the parties to negotiate	2	2	5

The regulation of MVNO access to existing networks was suggested by two of the industry players. They argued that MVNOs are an easy way to enter a market for new investors. They both pointed to Virgin Mobile, the only MVNO that is operating in South Africa, and how Virgin Mobile never even tried to build an own network, but always “piggybacked” on another operator’s network, thus shortening their business deployment cycle while establishing a fully operational company. The regulatory requirement relates to both access and pricing for such deals, because “... *[without regulation] an incumbent could price the network leasing request beyond the point of sustainability, thus effectively preventing the MVNO business from entering the market.*” explained a respondent.

The opposing view, coming from two respondents, was that MVNO operators are free to approach and negotiate terms and conditions for network space leasing with any network operator as things stand, and so there is no need for Regulatory interventions in that area. They also point to the “success” of Virgin Mobile in South Africa as an example of how, left alone, the industry can accommodate such a business models with no assistance from the Regulator.

MVNOs are not regulated in South Africa. While it is true that Virgin Mobile is a relatively successful MVNO in South Africa, they have not made a real impression in the market, but appear to occupy a niche space of being seen as a premium brand. Just as with national roaming discussed in section 4.3.2.2.1, the MVNO allows for use of an incumbent's existing network, and the MVNO attaches its branding, pricing and bundling of telecoms packages, distribution channels, and sometime even billing. This would clearly be an easier way for an operator to enter a market – the upfront network investment is avoided.

Examples of Regulations of MVNO are hard to come by around the world, so the pricing aspects appear to be generally left to the market to be negotiated. The popularity of the MVNO businesses in continental Europe would suggest that they are at the very least viably operated, and have contributed greatly to a vibrant and competitive market.

4.3.2.1.5 Reference Interconnect Offer (RIO)

Policy objective	Responses	Supported	Not supported	No opinion expressed / Not applicable
To support wholesale rate transparency for dominant players	Limited views received: Important to allow for smaller players to understand the basis of pricing	1		8

The concept of RIO was mentioned by one operator as a form of “wholesale service menu” that should be lodged with the Regulator by the dominant players. There was no second opportunity to get the opinions of other players; this came up at the last research interview engagement.

This suggestion is also mainly about transparency of pricing by the large operators to their wholesale customers. The principle of RIO is that the wholesale services must be priced on a cost-plus basis, and the margin must be reasonable in the particular context (OECD, 2004). There appears to be fairly widespread use of this measure in Europe (OECD, 2004), and the regulatory authorities are moving in that direction in India. The intention is to provide pricing predictability and certainty.

The application RIO clearly requires a fair amount of verification and monitoring by the Regulator. This administrative burden could either be borne by the Regulator, or be transferred to the operators themselves to provide an audit report on their calculations. Either way, the cost of pricing validation would most likely be considerable, and that cost should be weighed against the benefit of the disclosures. There is little doubt that a full RIO implementation would allow players to choose the types of offerings that they would like to acquire from the dominant players. At the same time, it would not be patently unfair to the dominant players because they would be getting cost-plus margins. Theoretically, national roaming and MNVO services discussed above, could also be included in such RIO disclosures, thus avoiding the possibility to regulate them separately.

4.3.2.1.6 Distribution network exclusivity

Policy objective	Responses	Supported	Not supported	No opinion expressed / Not applicable
Prohibition of channel exclusivity agreements	Limited views received: Important to provide access to markets for all players	1		8

One respondent mentioned that the regulator can help with some form of intervention to stop the practice of distribution channel exclusivity. He explained that customer access to the services of all the players in the market should be the guiding principle, and not just commissions and margins offered to retail outlets. *“This really stifles competition while further entrenching the dominance of the players with deep pockets”*, he explained.

Exclusive access to certain chosen locations gives a business a certain measure of scarcity and thus “uniqueness”. This would be a legitimate business strategy in terms of Michael Porter’s theory of differentiation as a basis for competitive advantage. Any involvement by the Regulator to disable the ability of the players to achieve that uniqueness would likely cause a fair amount of consternation in the market. On the other hand, the effective lockout of some brands from certain channels goes against the spirit of providing easy access to the widest range of choices for the customers. There is no widely known case where such an intervention is implemented in the telecommunications industry. Exclusive channel agreements are a common practise in the commercial world, most notably in industries like vehicle sales and clothing stores, where only certain makes or brands receive exclusive space allocations to the exclusion of others.

4.3.2.1.7 Network licensing and industry consolidation effects

Policy objective	Responses	Supported	Not supported	No opinion expressed / Not applicable
Issuing of network licenses	No consensus of views: • More players provide more competition	5	4	0

	Few players can survive meaningfully			
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There was a range of views here about the best number of network operators that should be licensed in South Africa. Five respondents felt that the current situation of two large and two smaller network operators is not working, and requires more licenses to be issued. However, all these respondents believe that it may too late to issue new license because, as one put it, “...*the most lucrative and profitable parts of the country have been covered to death, so what will a new operator do there?*” Be that as it may, the underlying rationale being provided here was that there is not enough competition at a wholesale level, leading to the unassailable dominance by MTN and Vodacom.

Another view expressed is that whenever an operator is acquired by another, as in the current spate of industry consolidation, the Regulator should issue a new license in order to replace the operator that was acquired, and thus maintain the number of independent operators. The necessary conclusion of this view, expressed somewhat incoherently by one respondent, is that “...*industry consolidation should not be allowed to reduce the number of players.*”

The opposing view argued that a good network infrastructure is the starting point for all telecommunications objectives, including expanding access to telephony, as well as for improving the quality of service at affordable prices. The four respondents here argued that only players who have a substantial scale can afford to make the required level of investment in network infrastructure that is critical for the success of the telecommunications industry in the country. Their view is that realistically, the

necessary large scale operation can only be attained by few players in the market.

One respondent argued:

“Unfortunately, regulators have often used the blunt instrument which says that if you want competition in your industry, bring in more players.... In Ghana for instance you have 6 players. Only one is making money, the rest are not making money... So, unlike in many other industries, having more players does not necessarily guarantee that you will get the best price and the best service in the telecoms industry. And the reason for that is that the industry is so capital intensive. Other industries that don’t have the need for such [upfront] capital investment to be able to continue to sustain the quality of service, can probably afford to have a wider base of players because the capital barrier to entry is not so high.”

The current spate of consolidation, not just in South Africa but around the world indicates that there is merit in the argument for fewer stronger network operators, as smaller operators often come under enormous pressure in the market due to declining prices and reducing margins. This appears to be case with Cell C and Neotel in South Africa. What really affects the economic performance of the operators is the growth phase of the market.

There are few countries with four or more operators that are all relatively successful, like Nigeria and India, but this is due to the sheer size of the market that is still experiencing growing penetration rates. It is expected that once there is market saturation, the dynamics will change significantly and consolidation will similarly take place. South Africa has indeed reached that tipping point, with many studies indicating that the mobile penetration rates are well over 100%. The scope for growth for individual companies is severely shrunk, and customer growth is at the expense of another’s decline for the most part.

The “right” number of such large operators remains to be determined, probably driven by each country’s dynamics. The US telecommunications, where there are only two very large operators, namely AT&T and Verizon, is one example of the success of few large players. While there are many smaller players and “Baby Bells” and niche players, it is generally regarded that there is sufficient competition between those two large operators that prices are not artificially inflated. For example, looking at their published 2011 financial results, AT&T made a negative 20% profit margin, while Verizon just about broke even at 0%. This is compared with double digit margins by the South African large operators. It is therefore quite telling that, according to Justin Funnell (cited in GSMA) the 90% of telecommunications operators surveyed in Europe said that mobile markets should be allowed to consolidate to three players

The Regulatory challenge in South Africa is whether the authorities will leave the industry completely to market forces or they will intervene to target a specific number of players in view of the needs of the country. In this regard, in the SONA of South Africa on the 12 February 2015, the President said the government has “*decided to designate Telkom as the lead agency to assist with (the) broadband roll out*”. This would seem to indicate that Telkom is firmly in the picture for the foreseeable future. Given that government is not a majority shareholder in Telkom, there are interesting implications to that declaration by the President. It remains thus to be seen how the government plans to divide the broadband rollout amongst the other telecommunications players in the industry.

4.3.2.2 Infrastructure sharing interventions

Theme	Responses	Supported	Not supported	No opinion expressed / Not applicable
Network infrastructure sharing models	Limited views received: • Important to move competition closer to the customer and away from technical infrastructure.	5	0	4

“Move competition away from the infrastructure ownership to the service layer” was a call made by four of the respondents. The primary driver for such a call is that deploying an own telecommunications network is extremely capital intensive on the one hand, and the retail prices for both voice and data are dropping on the other. The security of investment is therefore going to be limited by the success of individual business cases. The respondents were at pains to explain that “[t]he data business case [in particular] is very difficult...” and that “... voice as a business proposition is not growing but dying”. Infrastructure sharing models to outflank this business challenge were suggested, and are discussed in the next sections.

4.3.2.2.1 National Broadband Network (NBN)

Conceptually, operators may build their networks separately, but eventually these networks are combined into one “super network”, called the national broadband network (NBN), with all the network backhauling (transmission) feeding into it. This combined network can then become the wholesale provider of infrastructure services to all the service providers on an equal basis, and the service providers compete at a service level only.

The benefit that has been suggested by the respondents is the reduction of duplication of costs, thus a net saving of resources for the companies and the country. Regulator may also have fewer challenges about interconnect rates between operators. Furthermore, the Regulator can then allocate all the broadband

spectrum to this entity and avoid the “spectrum wars” and expensive transactions like the Vodacom acquisition of Neotel that is currently before the Competition Commission (with MTN and Cell C objecting).

There is indeed some movement towards this concept, whereby infrastructure is increasingly being sold to specialised infrastructure management operators. A prominent one that has come to the fore is American Towers Corporation (www.americantower.com). With a physical presence in United States and in Brazil, Chile, Colombia, Costa Rica, Germany, Ghana, India, Mexico, Peru, South Africa and Uganda, and now owning or managing over 75,000 infrastructure sites in Africa, Asia and Latin America according to their website, ATC seems to be vigorously ushering in the era of outsourced or shared infrastructure. The success of such a model is not yet clear however, but the idea of shared infrastructure resources and avoidance of duplication holds good logical appeal for the Regulator to consider. Perhaps the strongest counter argument to this suggestion is the potential difficulty to get the network operators to agree the terms and conditions of such an arrangement. Apart from the cost, these would include issues like of ownership stakes, future rollout and investment, terms of access and maintenance, and service level agreements. This is where the Regulator may play a facilitation role.

4.3.2.2.2 Active RAN sharing

Another model of network sharing suggested by the respondents was called Active Radio Access Network (RAN) sharing. This is where network operators agree to pool their network infrastructure into some form of common ownership, like a joint venture, each one obtaining a dedicated part of the network.

The benefits would be the same as those of the NBN discussed above, while the controversy over control of the network would be largely resolved.

The operators in the UK have employed a variant of this model to good effect. O2 and Vodafone split up the country into East and West, and each company focussed their network build only on either East or West, and then they shared their full radio networks and backhaul transmission. By so doing, each company increased their coverage footprint by nearly 40% with the same investment.

The Regulator may also find an enabling role to play in the formation of such a structure.

In summary, the claimed benefits of network sharing arrangements are mainly threefold. Firstly joint building of networks is more capital efficient than separate rollouts, avoiding unnecessary duplications of infrastructure in the same geographical areas. Secondly, network construction and maintenance is not the core business of most mobile network operators, so getting out of those functions helps the operators to focus on their primary pre-occupation which is providing telecommunications usage solutions rather.

The opposition to joint infrastructure models is largely based on the suspicion taking out network expertise and capability as a source of differentiation and competitive advantage between mobile network operators may reduce the technological investment, discourage research into the latest trends, diminish in-house innovative, and the industry (and country) may move from being an “early adopter” of new technologies to “laggards and stragglers”. The benefits of network sharing models should thus be carefully weighed against these risks. There are of course hybrid models in between these examples, whereby the sharing is not complete, or is geographical specific, or even be applicable only to a particular layer of the network e.g. transmission agreements where operators contract for irrevocable right of use (IRU) over a particular fibre line as it happened with the EASSY and WACS cables in recent years.

4.3.2.2.3 Open Access Networks

A generic sharing model that was mentioned in passing by a number of respondents is based on the concept of “open access”. This can take many forms, from individual network build to joint built models. The main principles around open access are that firstly any player who wants to provide network services is never denied access at a wholesale level, and secondly that access is on the same basis for all the players, including those that are vertically integrated with the infrastructure owner, and finally that those who use the shared facilities must return them in the same condition that they found them in if and when they choose to leave.

Open access is a principle, a philosophy really rather than a specific model. There are many variants of the application of it, including the LLU that was discussed above. It a powerful “values” statement that the Regulator may consider as a foundation for its policy framework.

4.3.3 Direct market interventions to address market failure

Some interventions can be made directly in the retail space where the service provide meets the customer. This area is not generally considered desirable nor wise for the Regulator to get into due to the dynamic nature of interaction between the service providers and the market. However, there were some strong if limited views about some regulatory gaps here too.

4.3.3.1 SMS pricing

Policy objective	Responses	Supported	Not supported	No opinion expressed / Not applicable
Set the ceiling for SMS retail pricing	No consensus of views: This amounts to too much interference in the market	3	6	0

	The SMS retail price is exploitatively high			
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The issue of SMS regulation came up during the interviews, particularly in reference to other markets where this has been done. There were two opposing views on whether regulator should set the retail price.

The one view, expressed by the large network operators and most of the service providers, is that the market is competitive enough to set the SMS retail prices at the right levels. *“Once the regulator gets involved in this, who knows what else will follow...”* was one such sentiment. If the SMS is at the “wrong” price, the market will simply move away and the price will adjust accordingly, this argument goes.

On the other hand, there were strong but fewer views about the need to set a price ceiling on SMS. *“The [network] cost of sending an SMS is virtually zero, I know this for a fact”*. Another one was *“... I mean the cost of the SMS is a fraction of a cent. It’s bizarre that they [the regulator] agree to that [the current high cost].”*

There is obviously a sense that the operators are charging prices that are not cost based when it comes to SMS. With the consumer paying a headline price of at least 50c per SMS in South Africa, the profit margin per SMS could be considered to be exorbitantly high. This would then fall in the category of “market failure” described above, and thus would legitimately attract the attention of the Regulator.

This measure was indeed taken by the Regulatory Authorities in Nigeria and in Iran, setting a limit on SMS pricing, which cut down the then prevailing prices dramatically. The effect was a significant loss of revenue for service providers. MTN for instance, operating in both geographies, reported that in Iran data made up 25% of total revenue, and SMS was 75% of data. Therefore clearly the impact of a price reduction on SMS was material. However, the usage of SMS did increase after the

price reduction, partially making up for the loss of price with increased volumes (deduced from the MTN Group Annual Reports).

4.3.3.2 On/Off net differentials and other promotions

Policy objective	Responses	Supported	Not supported	No opinion expressed / Not applicable
To prohibit or reduce on-net/off-net price differentiation	No consensus of views: - Differentials deliberately frustrate competition - Differentials give good value for the customer	3	4	2

One respondent expressed strong views in support of regulating on-net/off-net differentials. Their logic was that the practice has the effect of taking away the possibility of customers ever looking to even compare prices, and “*amounts to predatory pricing when it falls below the interconnect pricing.*” This view was later supported by two other respondents when the scenario was tested with them by the researcher.

On the opposing side, four of the respondents argued that there is no reason to forbid an operator from offering low prices at any level if they think their business model can sustain it. “*Let them give away give everything away for free if they want, it’s their business after all...*” is how one respondent put.

The economic theory holds that under certain conditions large network operators can strategically use on-net/off-net differentials to restrict competition giving rise to increased network effects that discourage consumers from subscribing to smaller players. Furthermore, the smaller operators may lose out on benefits of interconnect asymmetrical rates as they cease to be net receivers of interconnect traffic. This

occurs because subscribers will tend to call other subscribers within the same network more, even encouraging their “frequently called” numbers like family and relatives to join their network away from the smaller operators.

This regulation appears to be a relatively new development in telecommunications. Countries that can provide case studies for this regulation include Chile, Papua New Guinea and Jordan, but they all have recent policy implementations in this area. It is thus probably too soon to make any conclusion about the effects of the regulation; more time is required to observe the see what effects it has on the customer satisfaction on the one hand and on the competitive pressures experienced by the smallest operators.

This researcher would urge the Regulator to embark on more in-depth studies before venturing into these areas; the risk of unintended and unknown consequences is always that much greater with new policy implementations.

4.3.3.3 Base management

Policy objective	Responses	Supported	Not supported	No opinion expressed / Not applicable
To prohibit or reduce the use of promotions and special offers	No consensus of views: • Base management used to deliberately frustrate competition • Differentials give good value for the customer	3	4	20

A practice similar to on-net/off-net price differentiation that operators employ falls in a category called “base management”. This practice came up because of public reports in 2014 that the regulator in Nigeria decided to prohibit most forms of “promotions”. When the researcher put this to an affected respondent, the

respondent elaborated on it as follows, “...*they’ve declared dominance for [the operator], and then said...you can’t do active base management. Active base management is where [operators] go to a customer and offer such unbelievable value below the line, that the customer never wants to leave the network. You segment your base and say all these customers who are in this part of the network, with these characteristics, you say to them ‘between this time and that time you are going to get your calls at half price’, or free calls from this hour to that hour. So you customize the value proposition for your customers based on the customer profiles and behaviour. But this is done in a manner which is not visible to the naked eye - directly to the customer base. ”*

Another respondent made the example of offering the customer a free e-mail address when they subscribe, and thus make them attached to the e-mail address that they never want to leave your service.

The effect of such promotions is strong customer retention. The complaint against such base management practices is that operators, especially large operators, use their dominant positions to squeeze out the other players in the market.

This is somewhat a bizarre situation because the customers want the promotions and certainly the final end-users want these benefits, but the regulatory authority opposes it. “*In their effort to create competition, the Nigerian regulator can be said to be engaging in anti-competitive behaviour.*” concluded the respondent.

The Regulator should be aware of this as an existing regulatory tool, and develop a clear understanding of when it is appropriate to employ, as well as its advantages and disadvantages.

4.3.3.4 Tariff transparency

Policy objective	Responses	Supported	Not supported	No opinion expressed / Not applicable
To encourage retail tariff transparency	No consensus of views: • Customers are able to understand products and make informed choices • Customers are confused by too many options	2	0	7

There were two respondents who expressed support for simplifying the retail tariffs.

“There are too many price plans and options for anybody without a PhD to understand! Others go and come back under different names. It’s impossible to compare similar packages these days, its likely customers are just sticking to packages that they are familiar with”, moaned one service provider.

A scan of the service providers’ websites confirms that indeed there is an inordinately high number of consumer packages and options in the market, and the comparison between them is quite challenging; it’s not easy for a customer to be sure that they are comparing like for like. A reduction and consolidation of the myriad of packages would go a long way in promoting real customer choice.

On the other hand, it has to be asked whether to regulate for simplicity is not patronizing the South African consumer. Is it not going too far to shield and protect people from themselves? Furthermore businesses purposely want to produce and sell something different that nobody else is selling to gain competitive advantage – this is the classic Porter generic strategy for growing the business (M. E. Porter,

1996). To tinker with that would take something away from business initiative and creativity.

4.4 Perceptions of the Regulator

4.4.1 Effectiveness of the Regulator

Theme	Responses	Effective	Ineffective	No opinion expressed / Not applicable
Effectiveness of the Regulator (ICASA)	Consensus of responses: • Under-resourced, ineffective • Showed glimpses of strength with the MTR regulations	0	9	0

All of the respondents expressed a strong perception about the weakness and the ineffectiveness of the industry Regulator. They also believe that such ineffectiveness is at the heart of the failure of the industry to meet the regulatory objectives. One respondent said, *“One of the concerns that I have ...is that the regulator is not well resourced, from a financial point of view and thus skills point of view”*. His sentiment was elaborated on by another operator thus, *“...when SATRA and IBA were merged to form ICASA there was a wealth of expertise. But over the years, because of the challenge ICASA had in getting [financial] resources from government, there was a lot of poaching of staff by the operators, and that on its own weakened the regulator. Because you find that the expertise sits outside now, they [the operators] can challenge any process that ICASA comes up with.”*

In addition to the shortage of financial resources and skills, the predominant view among the respondents was there is a high degree of political interference - the

appointment of counsellors who have an active operational role at ICASA. Another respondent was more worried about the number of the counsellors - too many in his opinion - rather than their actual involvement. Yet another respondent thought the issue is the inordinately short period that the counsellors are appointed for:

“...counsellors leave and new ones come in all the time, I don’t know why they don’t renew their contracts. Telecoms is very complex and requires people to spend years and years in the industry to understand...”

Well regarded regulators around the world according to industry comments are from Papua New Guinea, Ofcom in the UK, and SUBTEL in Chile, while the more aggressive ones include Nigeria Communications Commission and Communications Regulatory Authority of Iran. The motives for the aggression of the regulators on the African continent are aligned partly to their efforts to extract as much revenue from the telecommunications operators for state coffers as possible, and occasionally for private coffers when they can.

The Regulator may want to conduct a periodic benchmarking organisational structure, skills, internal processes, and the general state of the regulator environment with these authorities and others that may be well regarded around the world. They may also want to understand the less successful and aggressive models, and focus in particular on the extent to which the outcomes support or depress their own regulatory objectives.

The appointment of “a *strong CEO*” with effect from November 2013, as observed by one respondent who said he had recently engaged with the CEO, shows that the Regulator is determined to turn things around. The new CEO, Mr Pakamile Pongwana, made it possible to appoint a COO as well. According to the CEO, most of the work is now being done by the well qualified technocrats, albeit some of them

still going through the considerably complex telecoms industry learning phase. So ICASA is learning and has the potential to be a strong organisation.

At an operational level, ICASA recently demonstrated strong determination to follow through with their “cost to communicate” program that they kicked off in 2013, and that bodes well for the improved focus of the Regulator for the benefit of the industry. The 3 year roadmap that was shared by the Counsellors with Parliament in 2014 is a sign of better professionalism and process management. For example they have now ticked off the MTR as “done”, and no further action is required from them until 2017 on wholesale pricing.

Lastly, it is worth noting that the Regulator has passed regulations in the recent years that were congruent with international best practise, regardless of the outcome on the ground. These include:

- Number Portability – regulations passed in 2005
- Carrier pre-select – regulations passed 2010
- MTR – first effective in 2011, and then reviewed in 2014

According to the Regulator respondent, ICASA is working to a specific program of action, with the following issues being on their roadmap for the next 3 years:

- Spectrum allocation
- LLU
- Data Pricing
- Tariff Transparency
- On net/off net differentials

Some of these items have been discussed above as key issues coming from the industry players. Therefore by and large, the Regulator appears to be looking at the

same ranged of issues as what the industry is concerned about. It rests to be seen whether Regulator will find the best possible balance for the contradicting interests and objectives, and whether they will have the necessary alacrity to deliver on those key areas in a reasonable period of time.

4.4.2 Regulatory uncertainty

Policy objective	Responses	Positive effect	Negative effect	No opinion expressed / Not applicable
Providing predictable policy guidance	Consensus of views: Telecommunications policy direction and strategy ambiguous	0	9	0

All respondents mentioned regulatory uncertainty as a serious concern, impacting negatively on their ability to make long term business plans. The following were most prominent areas of concern that emerged from the respondents:

4.4.2.1 Telecommunications accountability incongruous

The ministry where telecommunications should reside is a matter of intense debate in the industry. *“The splitting of the Department of Communications (DOC) into two ministries, one being the DOC and the other the Telecommunications and Postal Services department, ...and then put ICASA under the DOC which is probably incorrect – should have been in Telecommunications - is very confusing...[T]he political environment is not helping ICASA”.*

The effect of a misaligned structural setup is an ineffective process of decision making. In the context of telecommunications, this means the industry might experience delays on important policy issues due to conflicting government mandates that crop up. For example, disagreements over the right location of

particular competences and jurisdiction between different Regulatory Authorities have partly contributed to the delays in the allocation of the high frequency spectrum since the policy was announced in 2006.

4.4.2.2 Telecommunications strategic objective not visible

The policy direction of the country is not very clear. This aspect in particular relates to whether the relevant department has any broad target structure for the industry. The respondent concerned pointed out that regulators in some countries do have a stated intention about the mix of large and small operators. *“In South Africa, the lethargy or reluctance by the authorities to visibly support the smaller operators might be a signal of their intention to have only two large operators and many smaller ones in the long run”*, argued the respondent. He concluded that *“The shareholders [of the smaller operators] want to know whether or not they should continue to invest the billions of rands into the network rollouts.”*

Even though such industry dynamics are largely dictated to by industry merger and acquisition (M&A) activity, the stated or implied policy position does have an influence on what M&A activity official bodies (like the competition commission) approve or decline.

The experience in many European countries is that the industry eventually settles on three large players, although in the US there are two major players and many smaller ones, largely driven by market consolidation and not government policy.

4.4.2.3 Spectrum allocation delayed

The Regulator has delayed the allocated the high frequency spectrum for many years. The Digital Dividend is also outstanding. The award of these

frequencies, as well as the scope and quantum thereof allocated to each operator, will be an important input in the investment plans of the network operators in crafting out how much capital they commit to infrastructure. This in turn will drive the level of innovation that the mobile content providers can develop and deliver to the customers on the back of the high quality networks.

4.4.2.4 Pricing regulations uncertain

The intervention of the authorities in the industry pricing makes it difficult to finalise long term business plans, and thus difficult to motivate for the continued infrastructure investments. In South Africa, the next review of MTR is due in 2017 for example, and there is no telling what the Regulator may decide at that point. The smaller operators are also not sure whether the Regulator will provide them with any further support to become sustainable into the future.

4.4.2.5 Direct market regulations threatening

The ability of operators to retain their customers through customized offers is a key driver of customer retention and innovation. Massive loyalty programs have been developed over the years at great cost to the operators, based on keeping existing customers by offering them “in-house” value. These programs have largely achieved their goal of lowering customer churn. The possible prohibition of on-net/off-net price differentiation for example “...*would take away the incentive to offer highly improvised offers and packages to customers.*”

On the other hand, the smaller operators need the customers to be willing to try other service providers instead of being “locked in” by discounted offerings

within the large networks. In this regard, the smaller operators were happy with the number portability regulations which allow customers to change service providers, although this does not appear to have materially changed the subscriber landscape. Be that as it may, the Regulatory Authorities would do well to note that the majority of infrastructure investment has been driven by the large operators, and to be precautionary when they consider the effect of such “base management” prohibitions on the future development of the industry.

4.4.2.6 Input costs not aligned to other objectives

The costs associated with network rollout are extensive. The respondents mentioned the excise duties levied on imported equipment as major costs that push up the already high upfront capital outlay even higher. Also mentioned were additional surcharges imposed on specific categories of items such as air conditioners, being categorized as “luxury goods”. The cost of regulated prices like electricity was noted as getting more expensive by the year. *“With Eskom receiving double-digit tariff increases every year for the foreseeable future, this cost is a major input cost in telecommunications provision.”*, complained one respondent. All these inflating costs must be considered against the background of sharply reducing prices for telecommunication services. Although outside of the realm of the telecommunications Regulatory Authorities, these cost pressures present a source of profit unpredictability for network operators.

4.4.2.7 Open access and infrastructure sharing policies direction

unclear

The policies around infrastructure sharing and whether operators are able to access one another's networks, as well as the basis upon which those arrangements are permissible, is also an area that came up. At issue is the array of options that the Regulator can choose from, and no specific commitment to any particular model has been pronounced. These options range from own network build models, through joint build and ownership models, right up to totally centralized national network models like what they have in Russia. Each one of those models has implications for investment, innovation, quality of service, customer pricing, and competition levels.

4.5 Corporate structures for management of regulatory environment

Theme	Formal structures	No formal structures
Organisational focus on the regulatory environment	4	5

The five service provider respondents indicated that they don't have a formal department for the management of regulatory affairs. The predominant view was that most regulations in South Africa are directed at the infrastructure layer and not so much on the service layer. One respondent noted that *"... [regulations] move so slowly in this country. While we do watch and follow global trends, a lot of the time you can't implement the latest developments here anyway."* But he also noted on the positive side that *"...we've come a long way if you look where we were 10 years ago."*

4.6 Fuzzy Cognitive Mapping (FCM) modelling and analysis

4.6.1 Introduction

The Fuzzy Cognitive Maps seek to model the opinions of the industry players that were interviewed about the effects of regulatory policy on their businesses and the industry in general. The intricate links between numerous elements at play in the telecommunications industry have been hinted strongly throughout the presentation and analysis of the research results above. The causal connections between various actions and reactions also came through in the literature section, particularly the relationship between the attainment of regulatory objectives and economic growth (Beardsley, Bugrov, & Enriquez, 2005) (BusinessReport, 2014)(Olivier Boylaud, 2001). The logical conclusions that must be reached as a necessary outcome of connected practices are not always direct and straightforward, but some reasonably plausible associations emerged from the discussions with respondents, and in many instances corroborated by literature.

The ability of FCM to reflect outcomes from different interactions between regulations and the market forces is what makes the tool useful in this research. The researcher can play many different “what-if” scenarios and see what outcomes follow from different regulatory inputs.

The complex web of interactions and knock-on effects shown in the FCM is not exhaustive nor sacrosanct; each researcher can potentially come up with an additional or different set of interpretations. The use of FCM is thus not intended to produce scientific proof of the industry workings, but to depict the likely paths and

outcomes for different regulatory choices. That said, FCMs contain a good possibility of discovering unexpected and even undesirable consequences that may be hidden in the complex web of interactions, which may persuade the Regulator and other authorities to change the course of their current and future policy direction.

Finally, it must be noted that the FCM presented in this research report is supplementary to the grounded theory approach presented earlier, and accordingly only a limited number of scenarios are presented, with a specific focus on the regulatory inputs as the main triggers of market activity. Nonetheless, the outputs of the chosen scenarios are checked and matched for consistency with the findings previously discussed.

4.6.2 FCM Nodes

The nodes for the FCM were deduced from the researcher's understanding of the business models of the respondent companies, which were matched to the literature. In this regard, Li and Whalley provide an outstanding decomposition of the telecommunications market, business models, and drivers (Li & Whalley, 2002). Thereafter, the result summaries at the beginning of each topic discussed in this chapter were used as the basis to tally the number of times each element was mentioned as an issue. *Table 3* shows the final FCM inputs thus chosen by the researcher in no particular order of importance.

Table 3: FCM elements

(Count is out of 9 respondents)

Element of the industry	Frequency of mentions	Accepted as FCM node	FCM Classification
Security related regulations	7	No	Too specific, and not an influential element on performance
Industry competition levels	9	Yes	Transmitter/Receptor node
Profitability of business	9	Yes	Transmitter/Receptor node

Wholesale price levels	9	Yes	Regulatory input node
Asymmetrical interconnection rates	8	No	Reckoned under new entrants and smaller operators
Consistent network rollout	7	Yes	Transmitter/Receptor node
Cost of implementing regulations	7	No	Not avoidable either way
Local Loop Unbundling	4	No	Reckoned under Industry competition
Effective Regulator	9	Yes	Transmitter/Receptor node
Support for new entrants, smaller operators	7	Yes	Transmitter/Receptor node
Formal structure to manage regulatory environment	3	No	Not an influential element on performance
Industry players commitment to country's socio-economic development	6	Yes	Transmitter/Receptor node
On-net/off-net differentials	7	No	Reckoned under support for new entrants and smaller operators
Operator Base management	7	No	Reckoned under support for new entrants and smaller operators
Universal access (to telecommunications)	9	Yes	Outcome (Regulatory objective)
Affordable prices (customer's price)	9	Yes	Outcome (Regulatory objective) node
Good quality of service	9	Yes	Outcome (Regulatory objective) node
Speedy Allocation of Spectrum	9	Yes	Regulatory input node
Network infrastructure and innovation policies models	7	Yes	Regulatory input node
Retail price levels	9	Yes	Transmitter/Receptor node

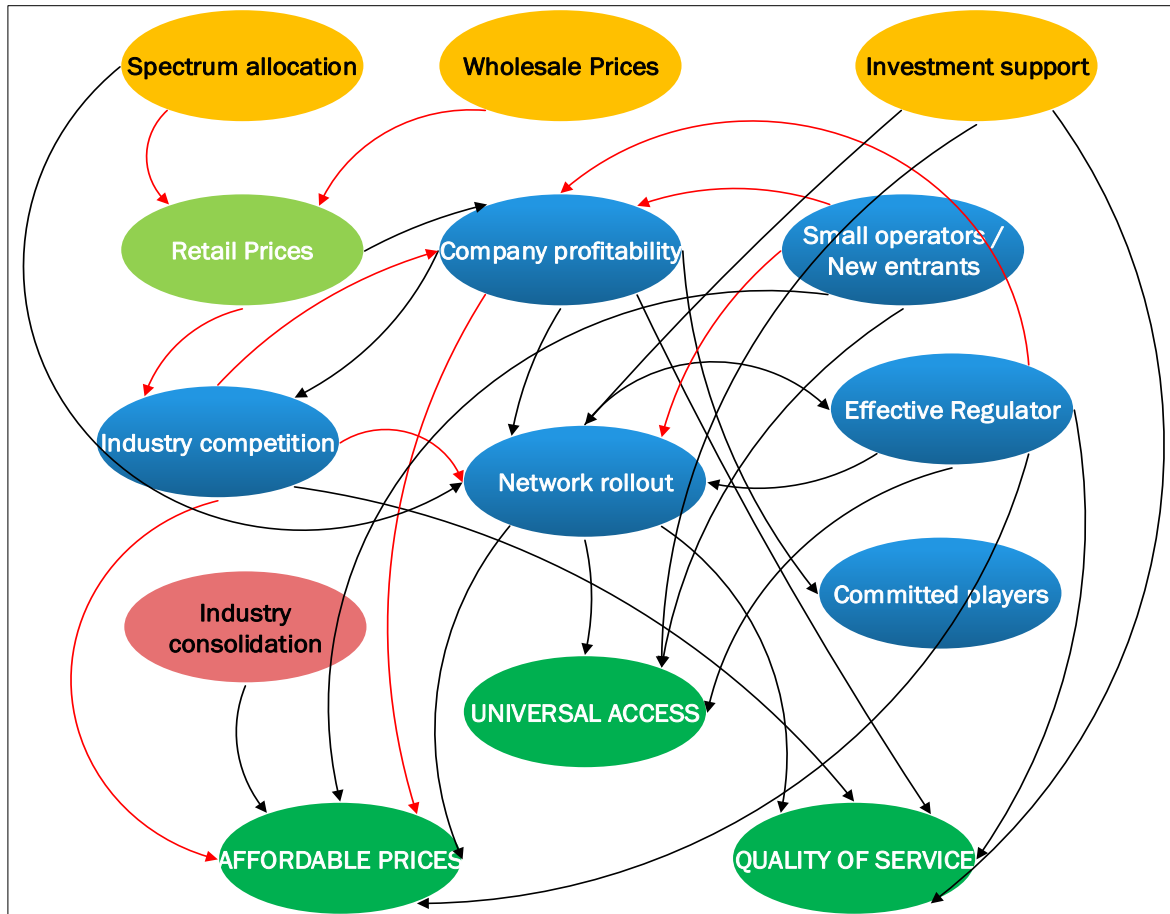
4.6.3 Cumulative scenarios

The approach taken below is to first present the overall, consolidated FCM, showing the relationships between all the variables. Thereafter, individual chosen scenarios, carved out of the overall map, are traced through the cycle from input to output, starting with the “base case” - the current scenario in the South African telecommunications industry as described by the respondents. Then the base case is modified by gradually adding more regulatory inputs, and observing the cumulative end-states that are reached. By so doing, the influence that various regulatory tools have on the achievement of the desired objectives can be observed and analysed.

4.6.3.1 Consolidated FCM

The consolidated FCM is shown in *Figure 1*.

Figure 1: Consolidated FCM



The complete relationships table is attached as *Appendix 3*, and the key relationships are described below.

The starting point of this FCM is the activation or non-activation of the policy levers that the Regulator and other Regulatory Authorities have at their disposal. The determination of wholesale prices (mainly MTRs), the allocation of spectrum, and then addressing the impediments to good network investment are the three regulatory levers under examination. The desired end-state is the attainment of universal access, affordable prices, and good quality of service. As discussed under

sub-problem 1 in section 2.2.3 above, there was clear support for these as the key objectives that the Regulator would want to achieve. Then the rest of the elements chosen, as shown in Table 3, are alternately “transmitters” and “reactors”, which simply means they have an influence on other elements, and are also influenced by them somewhere up or down the value chain. All of the transmitter/reactor variables received a high number of mentions during the interviews, and feature prominently in literature as discussed under both research sub-problems in sections 2.2 and 2.3 of this report. The main interactions are briefly described below.

High levels of competition are considered unfavourable to an extensive network rollout by the network operators, because high competition leads to reductions in price levels. That reduction in price levels puts pressure on the profitability of the businesses, and makes the business case for an extensive infrastructure investment program very difficult to get through the approval process in the companies. The inverse is also the case – low competition means the margins are good, and further investment means gaining a bigger share of the customer wallet. Under such conditions, operators would want to further expand their market reach in order to maximise the high revenue opportunities.

At that point, a further knock-on effect happens: an extended investment program translates into more geographical and population coverage and capacity, which in turn improves the universal access objective, and most likely the quality of service as well as users enjoy better network performance in terms of good voice clarity, less dropped calls, and faster data speeds.

The public comments on social media about the poor user experiences, and the typical responses about “low coverage area” and “network congestion” that are often

provided by the network operators provide some good face validity for the relationship between network coverage and quality of service.

Another set of relationships devolves from the regulatory lever of wholesale price policy. A reduction in wholesale prices by the Regulator theoretically translates into lower retail prices. Of course, the Regulator has no ability to enforce a pass-through of the wholesale price reductions, so it is up to the operators to pass it on to the retailers. However, in the presence of good competition, such wholesale prices are used by other operator to offer cheaper prices, thus forcing all the operators to respond. Following the 2011 interconnect rate regulations, Cell C did indeed come up with strong price-based competitive price offerings, which provided the first real challenge to the larger incumbents in the South African telecommunications industry in a long time. Cell C gained some market share at the expense of the larger operators on that basis, and prompted a price war and voice call prices per minute dropped progressively to 99c, then 89c, then 79c to the current offers or claims of less than 50c per minute.

Another strong plea that was registered came from the small operators. As noted in the discussion earlier, they are looking for a number of interventions by the Regulator, ranging from a significant asymmetrical rate to some form of direct regulatory interventions in the retail space, like limiting of on-net/off-net price differentiation as well as the prohibition or limitation of extensive promotions by the large operators. These are their requirements, duly established in this research as intended in terms of the research sub-problem 2 stated in section 1.3.2, in order to be more successful and add to market competition. The success of smaller operators as well as the arrival of new entrants were accepted as key driver of competition. Their success means increased competition, which then typically leads to lower

prices for the consumer. That in turn supports the regulatory objective of bringing affordable prices to the end user citizens of the country.

Lastly, an effective Regulator is assumed to be one that is able to juggle the different interests of the industry stakeholders and find the best possible balance. In this regard, a strong Regulator brings about a measure of commitment to socio-economic development of the country. Lower prices through voluntarily passing through of lower wholesale prices to retailers is one outcome of such an attitude. Conversely, hardened attitudes of key players lead them to act in ways that are driven by narrow business interests. The effect of shareholder primacy was discussed in the literature review under section 2.3.2 as one reason for the failure of telecommunications regulations in South Africa in terms of sub-problem 1.

4.6.3.2 Base case scenario

Although there was no complete consensus of opinion on the base case scenario as noted in the summary table above, it was possible to build a fairly clear picture of what the status quo looks like. The base scenario that emerged is that of an ineffective Regulator, low competition at a wholesale level but high competition as a retail service provider level. The profitability of the large operators is strong, but the smaller network operators are struggling. There has been a strong network investment, with both small and large operators spending upwards of R10 billion combined every year for the last six years. Those are thus reflected as the starting conditions for this stand-alone scenario. This output is attached at *Appendix 4*.

From the regulatory perspective, the Regulator has gone quite far with MTR regulation, and no further regulatory activity is expected until 2017/18, so this node is turned on in the starting conditions. Spectrum is still not allocated, and as noted by the respondents above, there are no strong regulatory efforts to encourage

investment. Accordingly spectrum and investment support nodes are switched off in the base case scenario.

The FCM reaches a steady-state of affordable retail prices only, and none of the other regulatory objectives. This result accords with reality of significantly reduced prices observed in South Africa, triggered by the drop in interconnect rates. This drop in prices was mentioned by many respondents who pointed out the operators' dilemma of having to invest massive capital in data networks, while coping data prices are dropping rapidly at the same time. One smaller operator quoted above even doubted whether that investment will ever be recouped.

It can thus be concluded that the Regulator's intervention on MTR has been relatively effective in easing the affordability pressure on the public pockets.

4.6.3.3 Spectrum allocation

If the Regulator allocated the high quality spectrum and the digital dividend is released to the industry players, the FCM model indicates that universal service and affordable prices are achieved; the outcome is attached as *Appendix 5*.

This outcome is also not surprising, because rich spectrum causes those with deep pockets to invest aggressively in capacity for high quality content. The 800MHz spectrum in particular, which is part of the digital dividend, has the technical characteristic that it allows for wider coverage with fewer base stations due to very long wavelengths that can be propagated on it (Faulhaber, 2006). This means that operators will be able to roll out networks that cover a wider geographical area with the same investment. That will logically increase access to a greater proportion of the population, thus making a contribution to the achievement of universal service,

and possibly quality of service as well. The price conditions remain as per the preceding scenario in the base case.

This FCM model suggests therefore that the prospect of a higher level of access to telephony can be advanced by an accelerated conclusion of the processes for the allocation of spectrum.

4.6.3.4 Investment support

Adding to the previous scenario, if the Regulator activates the measures to support the investment climate as discussed in section 4.2.1 above, the FCM can be used to model that scenario by switching on the “investment support” regulatory input node. The outcome shows that the interaction of the elements results in the achievement of the universal access as well as quality of service for the customers. However, there is a loss of the “affordable prices” objective – an outcome that is clearly not desirable for the citizens. This FCM outcome is shown as *Appendix 7*.

The activation of investment support achieves a step backwards, a reversal of regulatory gains already made with the previous policy inputs. However, a closer look at the elements clarifies the reason.

The increased investment in the previous scenario is likely to be skewed towards the more affluent and high income areas of the market. This phenomenon was described as “cherry picking” in section 4.2.3 above. This high end selective rollout applies no new price pressures in the market. However, once we have ubiquitous network driven by regulatory interventions, upwards pricing pressures rear their head once again. Niche services spring up, as was described by one of the respondents, many of them premium services, as operators and service providers try to arrest the

downward slide in profitability brought about by reducing prices, as well as the efforts to recover high upfront capital invested.

At this stage, it is thus clear that some of the policy interventions result in unintended consequences in the market. This is the balancing act that the Regulatory Authorities have to strive to achieve.

4.6.3.5 Small operator support, Effective Regulator, Increasing industry commitment

Having played all the regulatory “cards”, new scenarios can be examined by switching on and off different elements in the starting conditions within the FCM model. Additional scenarios are attached as *Appendices 7 and 8* where small operators/entrants, an effective Regulator, and increased Industry Commitment to socio-economic development are gradually switched on.

An addition of successful small operators for instance results in the same result as the previous scenario – universal access is achieved and there is an improvement in service quality levels, but affordability remains an issue.

This may be somewhat odd at first glance, as smaller operators as new entrants would be expected to heat up competition in the market and thus exert downward pressure on prices. However, one plausible explanation for the muted effect of these inputs is the combination of scale and stage of market development:

Small operators and new entrants that come in when the market is already saturated have very little wiggle room to manoeuvre. As already noted earlier, mobile penetration in South Africa is well above 100%, and thus new customer acquisition is a lot more challenging than it was when the market was still growing at high steady rates. Now the game is mostly winning over customers from other players with

attractive offerings, which is very difficult given the economic power of the large entrenched incumbents. These new entrants can thus become successful only if they don't over-extend themselves in the market. An example is Virgin Mobile in South Africa, who entered the market and chose a niche segment but did not try too hard to grow into the mass market. They utilised the classic Porter strategy of "focus differentiation" as their source of competitive advantage to good effect, positioning themselves as a premium brand and managing to existing customers feeling special (M. E. Porter, 1996). This type of success does not influence the price levels in the wider industry because of limited scale of operations. Therefore, when spectrum is already out, networks infrastructure pervasive, and market penetration levels very high, the entry of new small players does not change the price dynamics, but does challenge the incumbents to keep an eye on the quality and value of their services. Similarly, the improvement in performance of smaller operators does not threaten the incumbents because they have deeper pockets to sustain any short term price onslaught. As one respondent from a smaller operator observed, *"you can only compete on price for so long, at some point you've got to focus on being sustainable..."*

An improvement in the effectiveness of the Regulator is shown to have a positive effect on all the three objectives. However, that effect derives from their application of the right doses of policy inputs, as well as market reactions to those regulatory inputs. In the FCM model, the separate modelling of an effective Regulator therefore does not change the status quo – it has to work through other drivers to have any impact.

In fact, switching on the remaining element in the starting conditions – industry commitment to raising the socio-economic levels in the country - does not change

the picture at all as *Appendix 8* suggests. This is because industry commitment to socio-economic development, like effective Regulator, is also an indirect element that does not act on its own, but depends on other elements lining up in the right mix to have the desired effect.

Does it mean the model has now reached its limit? Is there any other variable that can trigger movement and improve the situation? The next and final scenario provides one such possibility.

4.6.3.6 Industry consolidation

The one catalyst for a shift in the market is the entry of a large player that comes in and consolidates the smaller operators. There was some media speculation in 2014 that Orange, a large operator from the United Kingdom, was looking around and could be a potential buyer of Cell C. A significantly large entrant would be able to use the allocated spectrum to rollout out much more aggressively than the smaller players can. The current round of M&A activity in South Africa is largely driven by precisely that motive of spectrum access to support network rollout. The intended acquisition (still pending with the Competition Commission) of Neotel by Vodacom is exactly due to their (Neotel's) possession of the desired spectrum, and Vodacom has made no secret of their intention to use that spectrum to roll out their LTE networks much more aggressively and widely. Similarly, the talks between MTN and Telkom to link up their networks is largely due to MTN's interest in the high quality spectrum that has been allocated to Telkom as a vehicle to speedily and widely deploy their LTE network.

So the entry of a large player who challenges the dominant incumbents and rolls out an extensive LTE network would continue to push up the competition over a wider area of the market, and thus cap any initial price increases that are expected to

result from high quality services, like high definition (HD) content. In this scenario, the FCM model reaches the end state of achieving affordability simultaneously as universal access and high quality of service. The outcomes are shown as Appendix 9. According to this FCM model, this would then be the ultimate policy mix that the authorities would want to drive and support. It is to be noted that this outcome was achieved by altering the payoffs and introducing a new variable that was previously not considered – that of large scale industry consolidation.

This is an intriguing possibility, given the persistent protests that emerged from this research about the market structure of the industry, variously described as a duopoly and oligopoly as previously discussed.

4.6.4 Final FCM caveat

It is to be borne in mind that this FCM model does not assign any relative weightings to the regulatory inputs, market elements and the eventual outcomes. For example, in the base case scenario the FCM indicates that the objective of affordable prices is achieved. That is not to be construed as an indication that the high “cost to communicate” issue at this stage is completely resolved in South Africa. What that FCM status really reflects is an acknowledgement of successive pricing improvements experienced over time, but does not capture the absolute extent thereof. Indeed there is still a considerable outcry about the high cost of telecommunications in South Africa, especially in comparison with other developed countries, and there is no doubt that more interventions and market dynamics are yet to play out in further improving the affordability of digital connectivity.

Similarly, all the outcomes reached under different FCM scenarios presented are not to be construed as absolute destinations, but rather as indicating the results of a mix of policy inputs and market elements at play.

5 CONCLUSIONS AND RECOMMENDATIONS

This research has showed that the telecommunications industry in South Africa has been affected by the regulatory environment in fundamental ways, with common and diverse experiences recorded depending on the size of the player concerned, and also depending on whether they operate in the infrastructure or the service layer. Either way, there is general agreement that the main regulatory objectives of universal access, with good quality service, and affordable prices are yet to be achieved, particularly with regards to data and internet connectivity. This should be a matter of grave concern to the authorities, as this industry is unavoidably central to the developmental plans for the medium and long term socio-economic future of the country. Access to and utilisation of information, and the relative proportions of the populations that do so, is set to differentiate the countries and nations that thrive and prosper from those that wither and decline; South Africa simply cannot afford to lag too far behind in this critical area.

The first working proposition for this research was that ineffective Regulatory Authorities, coupled with an industry concentrated around two very dominant players, is the leading cause for the failure of regulations. This proposition further suspected that the key players within the industry are not taking these developmental objectives seriously, but are rather more pre-occupied with their internal performance targets, primarily shareholder returns.

The second research proposition simply postulated that the key players in the industry have it within their power to change course and open up their vision to look beyond short term returns. In so doing, they could carve out a much more sustainable business environment for their shareholders, but also produce a telecommunications dividend to South Africa as a whole.

In order to get to test these propositions, the research was broken down into two sub-problems. The first one was to investigate, analyse and evaluate the reasons for the failure of these telecommunications objectives through detailed interviews with industry players whose positions and profiles indicate that they are or should be able to provide some insights. The second sub-problem was to find out from the same audience what, from their point of view, is required to get the outcomes that everyone – business, government, consumer, and literature - agrees are critically important objectives for the industry and the country.

With regard to the first sub-problem, it emerged from the research that the biggest challenge is the obstinate lack of vibrant competition within the industry that has allowed two mobile operators to almost completely dominate the industry, and thus basically determine the course and fate of the industry. Such concentration in the industry has left very little room for others players, least of all smaller entrants, to mount any credible and sustainable challenge.

This is a legacy problem whereby both the licensing authorities and the operators were taken by surprise at the dramatic success of the two licensees and the speed with which that happened. From there onwards, the Regulatory Authorities were always playing “catch up”, while the operators were consolidating and entrenching their unfettered market positions in those early days. They were even accused of deliberately foreclosing the third mobile operator when it was eventually licensed some seven years after them. Their actions, coupled with the Regulator’s lethargy, probably fatally crippled the chances of success for the third operator, and with that irrevocably impaired any prospect of good open competition in the industry.

All other reasons for the failure of regulations mostly stem from that industry concentration which brought about low levels of real competition. Under such

conditions, the dominant operators have largely had the upper hand in driving the direction and fate of the industry.

On the other hand, the critical role played by the dominant operators in driving the development of the industry came through clearly and just as strongly in the research. The intensiveness of capital investment required in the telecommunications industry is likely well beyond what the state can be willing to commit at this juncture. In this regard, the announcement by the President that Telkom will lead the broadband rollout for the country is quite curious (SONA, 2015). The large operators, precisely because of their dominant size and scale, have been able to invest heavily in network infrastructure, and have kept the country at the cutting edge of technological advances and innovation by any international standards. So the dominance of the industry by two operators stifles competition, but it also enables large scale telecommunications investments. There is clearly a policy dilemma that the Regulators Authorities have the responsibility of addressing and to make wise choices around. Questions remain about whether the authorities make the best trade-offs in these situations.

The ineffectiveness of the Regulator emerged as a real issue, clearly because the industry needs recourse to address the market failures described above. However, it was also contended that the dominant operators are complicit in that ineffectiveness: they have reportedly actively poached good talent from the Regulator's office, with the suspected intention of weakening it. Lack of adequate financial resources for the Regulator to acquire and retain talent is said to be an issue, and the line department in government, currently the Department of Communications, would do well to take heed of that challenge and provide adequate funding to make ICASA as attractive a working environment for best talent as possible.

Other reasons advanced for the failure of regulations relate to how the industry players experienced the Regulator's efforts. The reduction of MTRs for example prompted a serious backlash from the industry, including large-scale retrenchments, massive reductions of connection incentives previously paid to the retail sector, reduction of network investments, and wide outsourcing of services. These are strategic reactions that fly in the face of the country realities of high unemployment rates, low entrepreneurial success, slow broadband coverage, and massive outcry against outsourcing of services to name a few – all done under the guise of cost efficiency, and maintaining (already very high) profit margins for the shareholders. Industry also complained about the high cost of implementing regulations. There is evidence of merit in that concern - RICA was a particularly costly piece of legislation to implement and to manage for example. The Regulator could consider some opportunities for financial relief in future legislation.

Commendably, the Regulator has put in some major efforts in driving the policy objectives, performing under trying conditions at times. The MTR reductions did (eventually) have the desired effect of significantly reducing the cost to communicate in South Africa, although is still not enough by many accounts.

Unfortunately, there were some reported unintended regulatory consequences along the line as well, particularly during the liberalisation process in the industry. These include the complete destruction of some niche business models, and some inadvertent crowding out of smaller players. For all future regulations, the authorities need to be acutely alert to potential “collateral damage “at all times and proactively to put in place mitigating measures.

It is thus confirmed, as initially proposed, that the combination of an ineffective Regulator, a concentrated industry structure, and operators who have framed

regulations in narrow inward looking terms, are responsible for the poor regulatory outcomes in the industry. However, the order and weight of the “blame” can most likely be first and foremost towards the industry structure challenge – the existence of dominant players that restricts real competition, and their relentless drive to maximise profits at an inordinately high cost to society. The ineffective Regulator would rank lower than the other two elements.

The large commercial players, again to their credit, are not oblivious to the Regulator’s challenges and are optimistic that the right prescriptions can be found, as one respondent articulated it:

“...it’s a difficult thing being a regulator at the moment. You have the objective of regulating the industry. The man on the street wants good quality of service at unbelievable prices. The shareholder will say you regulate the industry in such a way as to encourage people to invest, which is a euphemism for you are creating an environment for [business] to maximize their return – that’s the capitalist system, capital goes to where it gets the highest return for the risk that its taking. So immediately, if I take just those 2 stakeholders, there is an inherent conflict in what they consider to be good regulation, they seem to be pulling in opposite directions... So I think the regulators have a very difficult job, despite the fact that we always criticise them, because inherent in the industry are vested interests...That’s at the heart, I think, of what regulators are battling with at the moment. It’s not easy to achieve [the right] balance, but it can be done.”

The Regulator does some (new) cards up its sleeves though. The allocation of spectrum is still pending, and the Digital Dividend is eagerly awaited. The new data space provides an opportunity for the Regulator to address some of the shortcomings and inadvertent mistakes that occurred during the heady days of voice cellular growth in South Africa, not least of which was the lethargy and reluctance by the Regulator to make decisive interventions at an early stage to stimulate competition.

With regard to the second sub-problem - the requirements and suggestions for better outcomes - a number of suggestions were made. These range from indirect interventions at wholesale level, like larger asymmetrical rates to benefit smaller players, through direct interventions in retail operations like limiting on-net/off-net price discrimination, to facilitating an environment that allows for easier, quicker, and cheaper access by the smaller players and service players to network infrastructure at a wholesale level. With regards to the latter point of wholesale network accessibility, the establishment of a National Broadband Network, the regulation of (currently unregulated) MVNOs, and better price control on national roaming agreements came up as options that can have the effect of supporting the smaller operators. What is common to all the proposals, is that they are all efforts to give other operators a “fair” chance at being successful competitors in the industry.

Notably, the large operators did not ask for much involvement by the Regulator at the level that affects operations. They only need the Regulatory Authorities to do the technical aspects correctly and speedily, like issuing the spectrum and approving the proposed M&A activity (Vodacom/Neotel, MTN/Telkom Mobile). Regarding the latter, the smaller operators, Cell C and Telkom Mobile are objecting to those respective M&A transactions on the basis that the result will again be a tightly controlled industry structure.

5.1 Recommendations for Regulator

The Regulator should look at the industry structure and make some decisions about how they can enable a wider range of players to participate. There is an opportunity with the spectrum licences that are still coming. It is recommended that the Regulator performs some benchmarking with similar countries and determine the standing of the South African telecommunications industry in terms of pricing, access

and quality of service. This will assist them in determining whether there should be any further measures, regulatory or otherwise, that can be taken to prod the local industry in the right direction. The range of available tools and levers, based on case studies and experiences in other geographies have been suggested and discussed in this report. The Regulator should consider and evaluate some of these options.

One area that may have the greatest impact is that of M&A. It was shown in the FCM models that the entry of a large mobile operator in the South African market could really make an impression, and drive competition harder and farther, with the resultant reduction in prices. In this regard, the issues that cause regulatory uncertainty that are referred to in section 4.4.2 of this report need some urgent attention. The investment climate in the industry will be and remain gloomy for as long as there are such major grey areas and blind spots. Potential investors would have as much interest in this area as the lenders of finance and other interest groups like the rating agencies.

In the meantime, the Regulator should not forget the plight of the smaller operators. The Regulator ought to remember that the promise of sustainability was made to the third mobile operator when it was licensed, but the Regulator failed to provide the requisite support, both by commission and omission. Avenues for redress should thus be pursued, and regulatory proposals that prop up and benefit the smaller operators should be looked at favourably and urgently.

The urgency of the need to finalise the allocation of spectrum cannot be over-emphasised. It was discussed earlier that spectrum availability is a major trigger for the next phase of data network rollout. This is the reason for the flurry of M&A activity in the industry. Spectrum will also trigger increased investment, which will result in increased coverage and possibly better quality of service.

Opening up wholesale access to other operators and service providers is an important measure as mentioned above. The finalisation of the LLU, as well as open access regulations could be speeded up. This is a matter of promoting competition once again; this time the Regulator has considerable power to influence it.

The USAF and its effectiveness in extending broadband access is still unclear. The Regulatory Authorities need to do a serious introspection of the theoretical role and practical efficiency of this instrument in achieving the regulatory objective of universal access.

Lastly, this researcher would caution against any interventions in the retail space. The matter of limiting promotions to own customers – base management - is a very sensitive one, and as shown in the literature, it is not a widespread practice at the moment; the results of such policy interventions are still hazy at this time. What is known with more clarity is that private capital does not like to go to markets where the regulatory authorities are too active.

5.2 Recommendation for commercial players

The large telecommunications companies would do well to heed the regulatory objectives mentioned, and take their sustained achievement more seriously. The strategic framing of regulations appears to be very narrow, being left to professionals to manage. When such an important area is delegated to technocrats to manage, what happens, as discussed under literature review, is that the focus tends to shift from strategic support to “effective mitigation of (regulatory) risk”. By failing to voluntarily participate in sustained activity to drive universal access at affordable prices, the industry loses credibility as a social partner in the market. This does not bode well for the long term well-being of such businesses, exposing them to any credible entrants into the South African market in the future.

At a strategic level, the decisions that the companies make should not simply be the “legally right” ones, but more the “socially responsible” forward looking ones. Future sustainability has to be the ultimate goal of any strategy framework.

The smaller operators need to continue to work on proposing specific requirements with the Regulator, while recognising the difficulties faced by the Regulator.

5.3 Final Comments

There are other exogenous quasi-regulatory issues that affect telecommunications performance at the present time.

5.3.1 Electricity supply constraints

The current state of power shortages is predicted to continue into the foreseeable future, with no specific date for the new power stations to come online into the national grid. The network operators have taken various measures to mitigate some of the electricity impacts. For example MTN has reportedly rollout out a significant number of solar powered base stations in the outlying areas. The effect of this situation is to push up the cost of operating the infrastructure, and that invariably finds its way into the cost of communication for the end users. The Regulatory Authorities would do well to consider this additional cost push factor and provide suitable relief or rebate wherever possible.

5.3.2 Import duties on telecommunications equipment

Some capital goods are levied surcharges on entry into the country from overseas suppliers. These include luxury goods like air conditioners and refrigerators. In the telecommunications industry, the use of air conditioners is no luxury matter – every base station, by most designs, is equipped with at least one air conditioner as a technical requirement. The Regulatory Authorities may consider some form of

surcharge exemption on the importation of such items, or reclassify them for purposes of import taxes.

5.3.3 Telecommunications displacement of basic needs

Lastly, an isolated but noteworthy point that was raised by one respondent was how much the mobile phones has become an essential and almost addictive tool to the South African society, including the very poor. The spending on telecommunications by poor communities, in neglect of their basic needs and at times using social grants for children, is an externality of the industry. It is difficult to imagine regulatory interventions that can be implemented to protect the vulnerable in similar ways as age restriction is used for alcohol sales. But this is an issue that does require the attention of society and possibly the Regulatory Authorities as well.

5.4 Suggestions for Further Research

A proper quantitative study about the correlation between mobile telecommunications penetration in South Africa and economic growth does not appear to have been done. StatsSA has produced some figures, but they get lumped into ICT, and the GDP effect appears to be simply the combined turnover of that sector of the economy.

Another area that is ripe for research is the determination of the cost of sustaining high barriers to entry in the telecommunications industry. This would be quite pertinent to find out how the issue of competition can be addressed. However, that data would probably be quite challenging to dig out of the industry players. The bureaucracies that maintain the “industry walls” are unlikely to reveal their tools of trade.

Finally, what is not clear is the effectiveness of the USAF and USO as tools for broadening access. The role and impact of the Universal Service Access Fund in broadening access would make for a good case study.

6 APPENDICES

Appendix 1: Interview guides

Initial Interview Guide - INITIAL

1. [Please explain your business model, where you play in the telecommunications industry, and who your peers and competitors are?] Asked from the Service Providers only
2. Would you say that the space in which your business plays was facilitated by regulatory changes at all?
3. What would you say are the most important objectives that the regulator is driving? How are you supporting them?
4. How is your business affected by regulations?
5. What support would you still like to see from the authorities in order to help your business succeed?
6. How do you manage the relationship with the regulatory authorities?
7. What is your view of the effectiveness of the Regulator ICASA?
8. Any other comments about the state of the industry?

Interview Guide - AMENDED

1. [Please explain your business model, where you play in the telecommunications industry, and who your peers and competitors are?] Asked from the Service Providers only
2. What regulations have or had the most important effect on your business?
3. What would you say are the most important objectives that the regulator is driving? How are you supporting them?
4. What options do you think the authorities can consider around:
 - a. Pricing
 - b. Investment
 - c. Quality of Service
 - d. Broad access to telephony
 - e. Any other area that may benefit the industry?
5. What support would you still like to see from the authorities in order to help your business succeed?
6. How do you manage the relationship with the regulatory authorities?
7. What is your view of the effectiveness of the Regulator ICASA?
8. Any other comments about the state of the industry?

Interview guide - ICASA

Dear Cllr,

I look forward to meeting you this afternoon.

With regard to the questionnaire, as I indicated it is more a discussion than a question and answer session. The thrust of my questions is generally along the following lines:

The telecommunications sector that I am interested in is mobile and fixed telecommunications i.e. excluding broadcasting, technology, etc areas within the competence of ICASA.

There are 3 primary regulatory areas that I am interested in namely, Pricing, Access (Broadening), and Quality of Service (QoS).

Q1. Can you provide me some background/history of the Pricing regulations (including MTR) in SA

- What has ICASA done in the past?
- What has been the ICASA experience of the industry response?
- What is ICASA's assessment of the pricing position at this point i.e. are the regulations achieving the desired outcome?

Q1. Can you provide me some background/history of the Access regulations in SA

- What has ICASA done in the past?
- What has been the ICASA experience of the industry response?
- What is ICASA's assessment of the pricing position at this point i.e. are the regulations achieving the desired outcome?

Appendix 2: Interview Consent Form

“Regulatory environment and telecommunications industry performance in South Africa”

I, _____ agree to participate in the research study conducted by [researcher’s name].

The nature and purpose of the study has been explained to me in writing and verbally.

My participation is voluntary and I understand that I can withdraw at any time during the interview without any repercussions.

I understand and give permission that extracts from the interview may be quoted and published in the research report.

I also understand that confidentiality will be ensured in the research report and that no identifying features will be attached.

Signed _____

Date _____

I give permission for the interview to be audio-recorded Yes / No

Signed _____

Date _____

Appendix 3: Consolidated FCM

Industry competition	High Retail price levels	Business profitability	Network investment	Small operators /new entrants	Effective Regulator	Industry commitment to socio-economic development	Universal Access	Affordable Prices	Quality of service
			-1	1					
		1		1				1	
-1			1		-1	-1			
1		1					1		1
1	-1	-1							
1						1			
	-1				1				
	1	1							
1			1						
1				1					

Appendix 4: FCM Scenario 1 - Base Case

Industry competition	Company returns (Profitability)	Consistent network rollout	Successful Smaller Operators and New entrants	Effective Regulator	Industry players' Commitment to social development	Universal Access	Affordable prices	Quality of service	Wholesale prices	Spectrum allocation	Infrastructure investment support
1	1	1	0	0	0	0	0	0	1	0	0
0	0	1	0	0	0	0	0	1	1	0	0
0	0	1	0	0	0	0	1	0	1	0	0
0	0	0	0	0	0	0	1	0	1	0	0
0	0	0	0	0	0	0	0	0	1	0	0
0	0	1	0	0	0	0	0	1	1	0	0
0	0	0	0	0	0	0	1	0	1	0	0
0	0	0	0	0	0	0	0	0	1	0	0
0	0	1	0	0	0	0	0	0	1	0	0
0	0	1	0	0	0	0	1	0	1	0	0
0	0	0	0	0	0	0	1	0	1	0	0
0	0	0	0	0	0	0	0	0	1	0	0
0	0	1	0	0	0	0	0	0	1	0	0
0	0	1	0	0	0	0	1	0	1	0	0
0	0	0	0	0	0	0	1	0	1	0	0
0	0	0	0	0	0	0	0	0	1	0	0
0	0	1	0	0	0	0	0	0	1	0	0
0	0	1	0	0	0	0	1	0	1	0	0
0	0	0	0	0	0	0	1	0	1	0	0
0	0	0	0	0	0	0	0	0	1	0	0
0	0	1	0	0	0	0	0	0	1	0	0
0	0	1	0	0	0	0	1	0	1	0	0
0	0	0	0	0	0	0	1	0	1	0	0

Appendix 5: FCM Scenario 2 = Scenario 1 + Spectrum

Industry competition	Company returns (Profitability)	Consistent network rollout	Successful Smaller Operators and New entrants	Effective Regulator	Industry players' Commitment to social development	Universal Access	Affordable prices	Quality of service	Wholesale prices	Spectrum allocation	Infrastructure investment support
1	1	1	0	0	0	0	0	0	1	1	0
0	0	1	0	0	0	0	0	1	1	1	0
0	0	1	0	1	0	0	1	0	1	1	0
0	1	1	0	0	0	0	1	1	1	1	0
0	0	1	0	0	1	0	0	1	1	1	0
0	0	1	0	1	0	1	1	0	1	1	0
0	1	1	0	0	0	0	1	1	1	1	0
0	0	1	0	0	1	0	0	1	1	1	0
0	0	1	0	1	0	1	1	0	1	1	0
0	1	1	0	0	0	0	1	1	1	1	0
0	0	1	0	0	1	0	0	1	1	1	0
0	0	1	0	1	0	1	1	0	1	1	0
0	1	1	0	0	0	0	1	1	1	1	0
0	0	1	0	0	1	0	0	1	1	1	0
0	1	1	0	0	0	0	1	1	1	1	0
0	0	1	0	0	1	0	0	1	1	1	0
0	0	1	0	1	0	1	1	0	1	1	0
0	0	1	0	0	1	0	0	1	1	1	0
0	0	1	0	1	0	1	1	0	1	1	0

Appendix 6: FCM Scenario 3 = Scenario 2 + Investment support

Industry competition	Company returns (Profitability)	Consistent network rollout	Successful Smaller Operators and New entrants	Effective Regulator	Industry players' Commitment to social development	Universal Access	Affordable prices	Quality of service	Wholesale prices	Spectrum allocation	Infrastructure investment support
1	1	1	0	0	0	0	0	0	1	1	1
0	0	1	0	1	1	0	0	1	1	1	1
0	1	1	0	1	1	1	1	0	1	1	1
1	1	1	0	1	1	1	1	1	1	1	1
1	1	1	0	1	1	1	0	1	1	1	1

Appendix 7: FCM Scenario 3 = Scenario 3 + Small operator/new entrant

Industry competition	Company returns (Profitability)	Consistent network rollout	Successful Smaller Operators and New entrants	Effective Regulator	Industry players' Commitment to social development	Universal Access	Affordable prices	Quality of service	Wholesale prices	Spectrum allocation	Infrastructure investment support
1	1	1	1	0	0	0	0	0	1	1	1
0	1	1	0	1	1	1	1	1	1	1	1
1	1	1	0	1	1	1	1	1	1	1	1
1	1	1	0	1	1	1	0	1	1	1	1

Appendix 8: FCM Scenario 5 = Scenario 4 + Industry Commitment

Industry competition	Company returns (Profitability)	Consistent network rollout	Successful Smaller Operators and New entrants	Effective Regulator	Industry players' Commitment to social development	Universal Access	Affordable prices	Quality of service	Wholesale prices	Spectrum allocation	Infrastructure investment support
1	0	1	1	1	1	0	0	0	1	1	1
0	1	1	0	1	0	1	1	1	1	1	1
1	1	1	0	1	1	0	1	1	1	1	1
1	1	1	0	1	1	1	1	1	1	1	1
1	1	1	0	1	1	1	0	1	1	1	1

Appendix 9: FCM Scenario 6 = Scenario 5 + Large entrant Consolidator – NEW INPUT

Industry competition	Company returns (Profitability)	Consistent network rollout	Successful Smaller Operators and New entrants	Effective Regulator	Industry players' Commitment to social development	Universal Access	Affordable prices	Quality of service
0	0	1	1	1	1	0	0	0
0	1	1	0	1	0	1	1	0
1	1	1	0	0	1	0	1	1
1	1	1	0	1	1	0	1	1
1	1	1	0	1	1	1	1	1
1	1	1	0	1	1	1	1	1

7 REFERENCES

- Armstrong, M., Cowan, S., & Vickers, J. (1994). Regulatory reform: economic analysis and British experience (Vol. 20): MIT press.
- Attenborough, N., Koch, G., Maiorano, F., & Miller, T. (2004). Framework for Evaluating the Effectiveness of Telecommunications Regulators in Sub-Saharan Africa.
- Bachar, D. L.-F. Z. R. (2011). Corporate regulatory strategies in context: Telecoms and electricity reforms and the new order of regulatory capitalism. *International Journal of Organizational Analysis*, Vol. 19(3), 235 - 255.
- BalancingAct. (2011, 13 May 2011). SIM registration in Africa: Subscribers number down Balancing Act Africa.
- Beardsley, S. C., Bugrov, D., & Enriquez, L. (2005). The role of regulation in strategy. *The McKinsey Quarterly*, 4(21), 1-6.
- Brue, J. J. v. R. C. M. S. (2011). *Economics: Southern African Edition*: McGraw-Hill.
- Bryman, A. (2012). *Social research methods*: Oxford university press.
- BusinessReport. (2014, 01 November 2014). End of the road for Nashua Mobile, Business Report.
- Comninos, A., Esselaar, S., Gillwald, A., Moyo, M., & Naidoo, K. (2010). *South African ICT Sector Performance Review 2009/2010*. Research ICT Africa, Cape, Towna.
- Corbin, J., & Strauss, A. (1994). Grounded theory methodology. *Handbook of qualitative research*, 273-285.
- Creswell, J. W. (1994). *Research Design: Qualitative and Quantitative Approaches*. London: SAGE Publications.
- Cronin, F. J., Colleran, E. K., Herbert, P. L., & Lewitzky, S. (1993). Telecommunications and growth: The contribution of telecommunications infrastructure investment to aggregate and sectoral productivity. *Telecommunications Policy*, 17(9), 677-690.
- Dempsey, P. S. (1989). Market Failure and Regulatory Failure as Catalysts for Political Change: The Choice Between Imperfect Regulation and Imperfect Competition. *Wash. & Lee L. Rev.*, 46, 1.

- Dyner, I., & Larsen, E. R. (2001). From planning to strategy in the electricity industry. *Energy policy*, 29(13), 1145-1154.
- Esselaar, S., Gillwald, A., Moyo, M., & Naidoo, K. (2007). South African ICT sector performance review. Research ICT Africa.
- Esselaar, S., Gillwald, A., & Stork, C. (2006). South African telecommunications sector performance review 2006. LINK Centre public policy research paper(8), 1-64.
- Faulhaber, G. R. (2006). Information Economics and Policy: The future of wireless telecommunications: Spectrum as a critical resourc. Volume 18, Issue 3, September 2006, Pages 256–271, Pages 256–271.
- Gerber, B. J., & Teske, P. (2000). Regulatory policymaking in the American states: A review of theories and evidence. *Political Research Quarterly*, 53(4), 849-886.
- Gillwald, A. (2005). Good intentions, poor outcomes: Telecommunications reform in South Africa. *Elsevier - Telecommunications Policy*(29 (2005)), 469–491.
- Gillwald, A., Moyo, M., & Stork, C. (2012). Understanding What is Happening in ICT in South Africa.
- Goldstuck, A. B., Sean. (2011). 2-million face RICA cut-off – will you be one? *Gadget*.
- GSMA. (2013). Mobile Policy Handbook An insider's guide to the issues.
- Hafeez, S. (2003). The efficacy of regulation in developing countries: UN.
- Hennink, M., Hutter, I., & Bailey, A. (2010). *Qualitative research methods*: Sage.
- Hopper, T., & Major, M. (2007). Extending institutional analysis through theoretical triangulation: regulation and activity-based costing in Portuguese telecommunications. *European Accounting Review*, 16(1), 59-97.
- Leedy, P. D., & Ormrod, J. E. (2005). *Practical research. Planning and design*, 8.
- Li, F., & Whalley, J. (2002). Deconstruction of the telecommunications industry: from value chains to value networks. *Telecommunications Policy*, 26(9), 451-472.
- NationalPlanningCommission. (2012). National Development Plan 2030: Our future-make it work. Presidency of South Africa, Pretoria.
- OECD. (2004). Access Pricing in Telecommunications.

- Oliver, C. (1991). Strategic responses to institutional processes. *Academy of management review*, 16(1), 145-179.
- Olivier Boylaud, G. N. (2001). Regulation, market structure and performance in telecommunications. *OECD Economic Studies*, OECD Economic Studies No. 32, 2001/I.
- Pagani, M., & Fine, C. H. (2008). Value network dynamics in 3G–4G wireless communications: A systems thinking approach to strategic value assessment. *Journal of Business Research*, 61(11), 1102-1112.
- Porter, M. (1979). The Five Competitive Forces That Shape Strategy. *Harvard Business Review*, January 2008.
- Porter, M. E. (1996). What is Strategy? *Harvard Business Review*, Reprint 96608.
- Reporter, T. (2013). South Africa telecoms 'among the world's most costly', says new survey *Balancing Act - Telecoms, Internet and Broadband in Africa*.
- Ross, S. W., & Erasmus, L. D. (2013). Evolving the network operator's business model in an OTT environment using Fuzzy Cognitive Maps. Paper presented at the Technology Management in the IT-Driven Services (PICMET), 2013 Proceedings of PICMET'13:.
- SABCNews (Producer). (2014). Court to rule on Icasa, MTN and Vodacom case
- SAGovernment. (2014). National Integrated ICT Policy Green Paper. Government Printer, 44(37261).
- Shaffer, B. (1995). Firm-level responses to government regulation: Theoretical and research approaches. *Journal of Management*, 21(3), 495-514.
- Stylios, C. D., & Groumpos, P. P. (1998). The challenge of modelling supervisory systems using fuzzy cognitive maps. *Journal of Intelligent Manufacturing*, 9(4), 339-345.
- Wen, S. (2013). *Shareholder Primacy and Corporate Governance: Legal Aspects, Practices and Future Directions*. London: Routledge Publications.