



**WORLD BANK – BOTSWANA, REIMBURSABLE ADVISORY SERVICES PROJECT ON
ECONOMIC DIVERSIFICATION AND COMPETITIVENESS**

A REVIEW OF THE ICT REGULATORY FRAMEWORK IN BOTSWANA

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List of Acronyms

ADSL	Asynchronous Digital Subscriber Line
ASPs	Application Service Providers
BOCRA	Botswana Communications Regulatory Authority
BOFINET	Botswana Fiber Network Pty Ltd
BOP	Bottom of the pyramid
BSO	Basic Service Operators
BTA	Botswana Telecommunications Authority now BOCRA
BTCL	Botswana Telecommunications Corporation Limited
CASPs	Content Applications Service Providers
CMA	Malaysia's Communications and Multimedia Act
CRA	Communications Regulatory Authority Act (2012)
EDC	Economic Diversification and Competitiveness
FBO	Facilities Based Operator
GDP	Gross Domestic Product
GPMCS	Global Personal Mobile Communication by Satellite
IA	Indirect Access
ICT	Information Communications Technology
IDU	ICT Development Index
IPTV	Internet Protocol Television
ITU	International Telecommunication Union
MCMC	Malaysian Commission for Multimedia and Communications



MNO	Mobile Network Operator
MTR	Mobile Termination Rate
MVNOs	Mobile Virtual Network Operators
NFPs	Network Facility Providers
NGN	Next Generation Networks
NRAs	National Regulatory Authorities
NSPs	Network Service Providers
PSTN	Public Switched Telephone Network
PTO	Public Telecoms Operator
RAS:	Reimbursable Advisory Services - World Bank Program on Economic Diversification and Competitiveness
SIM	Subscriber Identity Module
SMS	Short Message Service texts
TOP	Top of the pyramid
UASL	Unified Access Service Licensing
ULF	Unified Licensing Framework
VANS	Value Added Network Services
VoIP	Voice over Internet Protocol



Executive Summary

The excitement about the extension of telecommunications networks and services in Botswana over the last few years, particularly in the area of mobile telephony, provides evidence of the potential that lies ahead for the diversification of its economy. However, while gains have clearly been made, this review of the regulatory framework suggests that Botswana's national policy objectives -- pervasive and affordable ICT services in the creation of a knowledge economy -- are sometimes undermined by its policies and practices, market structures and institutional arrangements.

While Botswana may have one of the highest levels of access to mobile telephony in Africa, the majority still do not have affordable access to broadband speeds for Internet connections. The enhanced ICT services required for effective participation in the knowledge economy and society continue to elude the vast majority of the country, and there is some evidence that Botswana's competitive position in ICT is slipping, as measured in international rankings. Retail and wholesale prices in the country continue to inhibit the deployment of services and their usage by consumers.

The results of the regulatory perception survey point to the massive challenge that all regulatory agencies face in the establishment and resourcing of autonomous agencies that are needed to build effective competition in ICT markets. This is particularly true now as we move from traditional sector-based regulation to competition regulation, and as we do so in an increasing converged environment. Institutional arrangements that constrain the autonomy of regulatory agencies will result in failure to create certainty and stability.

Supporting the long tradition of "cut and paste" regulation, which is the dominant form of regulation on the African continent, is the move towards horizontal licensing frameworks that are service- and technology-neutral. The *Unified Licensing Framework (ULF)*, proposed in this report for Botswana goes beyond that and supports international best practice of a framework that can meet the demand of a converged ICT sector that is optimized for the deployment of broadband, while recognizing local circumstances. Nonetheless, a move towards horizontal licensing assumes a fundamental restructuring of the market along with increased responsibilities on the part of the regulator. There is little point in moving to a horizontal licensing framework when vertically integrated incumbents and licensed players in the market are simply issued with multiple horizontal licenses that permit them to continue operating as they have been doing traditionally while issues of access to networks are not addressed.

Horizontal licensing frameworks can be a red herring. The focus of regulators has to be on creating the conditions for effective competition. In Botswana, given the dominance of wireless networks, this has to focus not so much on infrastructure roll out, but on affordability and ease of



access, ie demand-side rather than supply-side measures. The regulator’s ability to regulate the market will therefore require more than just having a framework. The ULF, as shown in this report, requires more effort on the part of the regulator in regulating the sector that now encompasses a much wider ecosystem. This will be seen in how the regulator structures itself internally and as well in its ability to remain independent of political and sector players in the market.



1. Introduction

1.1 Context of the Report

As well as being known for being one of the world's largest producers of diamonds, Botswana is also known for having one of the most stable economies in Africa. This stability and good use of its resources has transformed the country from being one of the poorest in the world, upon independence, to a middle income nation. In spite of this, around one-third of the population still lives below the poverty line, and HIV prevalence is high, an indication of the country's uneven wealth distribution.

To ensure the sustainable growth of the economy, the government has been trying to diversify the economy away from its reliance on diamond mining, with some degree of success; although the activity accounts for more than a third of the Gross Domestic Product (GDP), this is nevertheless down from about 50% in 1990. Diamonds still contribute 70-80% of export earnings and about one-third of the government's revenues¹.

It is in this light that the Botswana Economic Diversification and Competitiveness (EDC) Project, undertaken by the World Bank, was initiated at the request of the Botswana Government. This report responds to component 3A of the EDC project, which has five main components, as outlined in Box 1.

This report therefore seeks to underpin the other EDC components which are all tied to the diversification and competitiveness of the economy as a whole. Indeed as noted in a 2013 OECD report², the key to the success of the ICT ecosystem has been the presence of sufficient competition in the provision of network infrastructure and services. However, unlike other countries in Africa, Botswana's relatively low population (around 2 million) spread over a vast area (600,000 sq Km)³, makes it one of the least densely populated countries in the world, thus providing a major challenge for infrastructure investment.

Bearing Botswana's economic and geographical context in mind and as well as Botswana intended growth in diversifying the economy away from diamonds, this report seeks to provide an analysis of the current regulatory gaps and possible interventions by BOCRA in light of international best practice.

¹ Botswana Economic Outlook – www.worldbank.org/en/country/botswana.

² OECD Communications Report, 2013.

³ www.worldbank.org/en/country/botswana



Box 1: Overview of the Economic Diversification and Competitiveness (EDC) Program

The main components of the EDC program, undertaken between the World Bank and the Government of Botswana, are as follows:

1. Improving the Business environment. Specific segments of this component include:
 - Improving the business environment by streamlining business registration, licensing and permits issuance. (Counterpart Agencies: BITC, ROCIP)
 - Improving the business environment by streamlining EIA procedures. (Counterpart Agency DEA of MEWT)
 - Development and communication of Doing Business Reform roadmap and action plan (Counterpart Agencies: NSO, DB Committee Secretariat).
 - Developing a strategy for the introduction of regulatory impact assessment and related capacity building (Counterpart Agency: MTI)
2. Support in trade and industrial policies. The specific sections include:
 - Capacity building to support M&E of the national level strategies/policies at NSO (Counterpart Agency: NSO)
 - Advisory services to develop a framework for graduation of enterprises from government support under EDD (Counterpart Agency: MTI, EDD Unit)
 - Assessment of cross-border linkage opportunities in key value chains of three priority industries. (Counterpart Agencies: MTI and BOBS)
 - Advisory services to the Ministry of Trade and Industry
3. Infrastructure support. Specific areas include:
 - Technical Assistance for the Information Communication and Technology (ICT) Regulator and stakeholder workshop on licensing framework for BoFiNet (Counterpart Agency: BOCRA),
 - Establishment of e-Government policies and standards (Counterpart Agency: e-Government Controller, Ministry of Transportation and Communication)
4. Access to Finance. Specific components include:
 - A study on trade and working capital finance of SME exporters (Counterpart Agencies: BITC, BECI)
 - A study on strengthening the Credit Information System/Framework (Counterpart Agency: MFDP)
5. Skills and innovation. Specific components include:
 - Advisory services to develop an Operational Manual for the National Research Fund (Counterpart Agency: MIST)
 - Support to BIH on sustainable funding model, innovation fund and ICT incubator (Counterpart Agency: BIH)
 - Need assessment for capacity building of LEA in business development support for SMMEs.

1.2 ICT sector and regulation in Botswana⁴

Botswana's information and communication technology (ICT) sector continues to demonstrate dynamic growth, driven by the mobile sector. Mobile cellular subscriptions increased from 2,900,263 in 2011 to 3,081,726 in 2012, registering a growth of 6.3 percent. Mobidensity (the number of mobile cellular subscriptions per 100 inhabitants) increased to 150.1 percent in 2012⁵. Figure 1 below depicts this growth trend. Botswana continues to record one of the highest rates

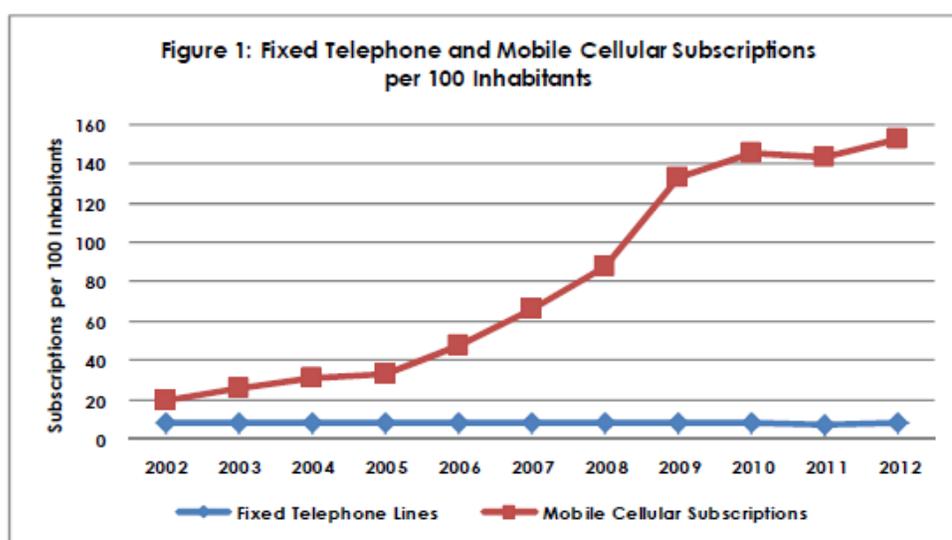
⁴ All data in this section taken from Statistics Botswana (2013) - Botswana Information and Communication Technology Statistics, 2012 Report. www.cso.gov.bw, and ITU World Telecommunication/ICT Indicators Database.

⁵ The Mobidensity figure is from ITU, which uses a different population base than Statistics Botswana.



of mobile penetration rate in Africa, above that of neighboring South Africa (134.8) and Namibia (103.0), but below that of Seychelles (158.3).

Despite the increase in mobile growth and penetration, mobile costs remain relatively expensive when compared with countries in the Southern African region. For instance, according to ITU data,⁶ the 2012 cost of a peak rate call to a fixed line in Botswana was US\$0.25 per minute (US\$0.42 if purchasing power parity exchanges rates, or PPPs, are used) compared with just US\$0.12 in Mauritius or US\$0.05 in Kenya. Similarly, the price of an SMS in Botswana is 3 US cents (or 5 US cents using PPPs), compared with 2 cents in Mauritius and 1 cent in Kenya.



Source: Statistics Botswana (2013).

The growth trend was also witnessed in the Internet sector where Internet subscriptions rose by 209.7 percent between 2011 and 2012, from 254,649 subscriptions in 2011 to 788,643 in 2012. This increase resulted almost entirely from the growth in mobile broadband, particularly 3G, which grew by 222.2 percent (from 238,942 subscriptions in 2011 to 769,805 in 2012). By contrast, fixed internet subscriptions grew by only 19.9 percent (from 15,707 in 2011 to 18,838 in 2012). However, broadband access (particularly access to fixed broadband) remains very low in comparison to other lower-middle-income countries, and the prices of all communication services remain high by both African and global standards.

In the fixed line network, however, the recent trend of decline has recently been reversed and the number of fixed telephone lines actually increased by 7.3 percent, from 149,578 in 2011 to 160,488 in 2012, surpassing its previous high in 2002. This may reflect the growth in

⁶ ITU (2013) Measuring the Information Society, 2013.



Asynchronous Digital Subscriber Line (ADSL) fixed broadband services. However, this is still very low by comparison with growth in the mobile sector. Teledensity (the number of fixed telephone lines per 100 inhabitants) has been almost constant since 2002; at around 8 lines per 100 inhabitants in 2012. This trend is not expected to increase at a higher rate in the coming years as mobile telephony remains the preferred mode of use in Botswana.

Thus, the competitiveness of the ICT market in Botswana can no longer be understood in terms of distinct voice and data segments. Voice and data services need to be understood in relation to each other if one is to understand the changing nature of business and impacts on consumer welfare. It is becoming increasingly difficult to distinguish between voice and data subscribers: airtime is increasingly converted for data use; data services are increasingly used to make voice calls, through voice over IP (VoIP); and paid-for Short Message Service texts (SMS) are giving way almost entirely to quasi-free instant-messaging services, such as Facebook Messenger or Whatsapp.

The impressive growth of the ICT sector is largely a tribute to the historical legacy of the early introduction of competition in Botswana, since the 1990s, and not necessarily due to more recent policy changes. Indeed, the current policy environment has not necessarily created an environment conducive to investment, nor are the current institutional arrangements likely to result in effective competition. Examples of policy failings include the long delayed privatization of Botswana Telecommunications Corporation (BTC) and the long delays in implementing the decision to separate out the Botswana Fiber Network (BOFINET) from the services arm of BTC, which has had a chilling effect on the market. This has resulted in a number of regulatory bottlenecks that constrain sector expansion.

Mobile penetration rates of over 100% reflect the high number of SIM Cards in the market, and multiple ownership of Subscriber Identity Module (SIM) Cards. There are now few differences in use of basic voice and SMS services, between mobile phone users in urban and rural areas, or between those at the top of the pyramid (ToP) and those at the base of the pyramid (BoP). The continued uptake and increased use of mobile phones have been stimulated by the availability of smarter devices at lower cost and by reductions in the cost of services.

Mobile prices have dropped via a mobile termination rate (MTR) reduction glide path established by BOCRA⁷, which committed to a termination rate glide path from 0.453 Pula in 2011 to 0.295 Pula in 2014. At the time of writing, MTRs were set at 0.348 Pula. However, the MTR is still far from cost, and the even the cheapest mobile prices in Botswana still lag behind countries where the regulator has enabled competitive pricing pressure by enforcing a cost-based MTR. For example: Botswana's termination regime is more expensive, on average, than other countries and

⁷ At the time, the regulatory agency was the Botswana Telecommunications Authority (BTA), but the new name of BOCRA, adopted in April 2013, has been used throughout this report, for consistency.



2.5 times the price of Kenya. High termination rates have a harmful effect on smaller operators because the majority of calls from a smaller operator are likely to terminate on the larger networks. In that sense, high MTRs are anti-competitive.

Botswana's ranking on the RIA Pricing Transparency Index is "mid-table" at 25 of the 43 sampled countries in the OECD 2013 price user basket by Research ICT Africa (RIA)⁸. In fact, Botswana ranks second lowest to Zambia in the price user basket when compared to South Africa, Namibia and Mozambique. This shows that although the enforced reduction of MTRs, and price pressures, have brought about a reduction of tariffs, Botswana's prepaid prices continue to be very expensive in comparison to many other African countries

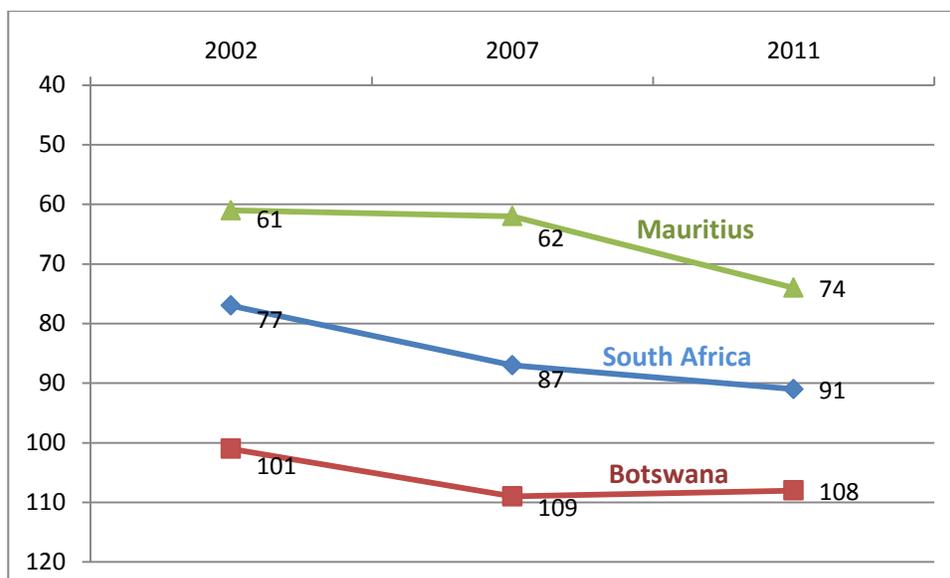
Areas such as broadband which have been shown to drive the economic sector in many countries remain outside the affordability for the majority of consumers. Consumers with access to broadband services are benefitting from stiff price competition between mobile operators seeking to attract and retain data customers. But it should not be assumed that the uptake of mobile broadband services – and the price competitiveness of these services in this more liberalized segment of the market – means that issues of affordable access have been fully addressed. Affordability and quality remain critical factors in generating faster diffusion of internet which in turn spurs economic investment and growth.

Botswana's competitiveness has declined at the international level, relative to that of other countries. One of the most compelling pieces of evidence for this failing performance is seen in Botswana's ranking in the International Telecommunication Union (ITU) ICT Development Index (IDI). Between 2002-2011 Botswana's ranking fell 7 places from 101st to 108th. In this it is not alone. South Africa's ranking slipped by 14 places and Mauritius by 13 places. The IDI is a composite index which tracks the position of individual countries relative to their peers across a range of 11 ICT indicators including international internet bandwidth per internet user, percentage of households with internet access, and both fixed and mobile internet subscriptions per 100 inhabitants. It should be emphasized that actual scores have been rising, in each case, as would be expected, but their ranking relative to other countries has fallen.

⁸ Research ICT Africa – www.researchictafrica.org



Figure 2: Declining rankings on the ITU ICT Development Index, 2002-2011, Botswana, Mauritius and South Africa



Source: Kelly, T., Minges, M. and Donovan, K. (2013) *Broadband competitiveness in Southern Africa*, based on ITU “Measuring the Information Society (editions from 2009 to 2013).

Nonetheless, statistics on their own do not reveal the factors that have created them nor the decisions from the regulator that may have influenced their occurrence. *The success of policy interventions and the extent of any regulator’s independence are usually seen as a function of the decisions it makes and how effectively it governs the sector to ensure that there is improved performance.* Indeed the rationale for establishing independent, often sector-specific, regulatory institutions is based on ensuring non-discriminatory treatment of all players in the liberalized market. This is usually assessed in terms of indicators for connectivity, price, quality of service (QoS), and choice. However, as noted earlier, numbers are purely indicators and may not reveal the regulatory gaps in the market on face value. Four broad imperatives guide the process of ensuring that the regulator is seen as independent. Namely:

- Cooperation is enabled in a competitive environment to ensure that a level playing field exists between unequal entities in the marketplace;
- All equipment suppliers are treated equally where the market is dominated by a single buyer with strong pre-existing relationships with suppliers;
- All new entrants and investors in the telecommunications service sector are treated equally by the dominant competitor, who will be a supplier of inputs (e.g., interconnection) to the businesses of the new entrants; and



- All customers have a “voice” and their complaints and interests receive an adequate response.

In addition, a regulator is also viewed as effective by the extent to which it is able to demonstrate the characteristics of accountability, transparency and predictability. Seldom however, do reports on ICT sector performance discuss the role played by the regulator and the extent to which regulatory decisions or non-decisions influence sector performance.

It is crucial that this report highlight the role of regulation in the ICT sector as catalyst for development and economic diversification. This report delves into the issues of regulation in Botswana that require improvement in driving the economy to a knowledge economy. In fulfilling the terms of reference, as modified in the Inception Report, the review of the regulatory sector is carried out within the context of the avenues available for the regulator in driving growth and competition in the market. The key question driving this section is thus *“To what extent has BOCRA achieved its mandate of creating a competitive environment to spur the growth of the ICT sector and fulfill the vision of a Knowledge economy for Botswana?”*

1.3 Objective and methodology of the report

The objective of this study, as defined by the Terms of Reference (TOR) in the Inception Report, is to assess the current regulatory environment of the ICT sector in light of its spurring competitive growth for the economy. In particular, the study focuses on the licensing framework that creates the existing market structure in communications sector in Botswana. In doing so, it should be noted that the report does not delve into the broader issues of regulation such as spectrum, universal access and price/cost models, all of which would require a much wider terms of reference and are better suited as separate studies on their own.

The report covers two main areas:

- a) Providing an analysis of the existing regulatory framework strengths and weaknesses as (evidenced through the licensing framework), giving consideration to regulatory benchmarks of applied internationally in other markets;
- b) Providing an account of current best practice in two specific areas where BOCRA feels that regulation is currently lacking, namely for Global Mobile Personal Communications by Satellite (GMPCS) operators and Mobile Virtual Network Operators (MVNOs).

The report has relied on interviews with a full range of stakeholders in the ICT sector in Botswana, various discussions and workshops with BOCRA and externally, and as well a review of existing reports on the sector (see *References*). The output is a comprehensive regulatory assessment that shows the various options available to BOCRA in its interventions in the newly converged ICT sector through regulation.



1.4 Structure of the report

The structure of this report is as follows:

- Section 2 is an analysis of the regulatory framework and regulatory interventions by the regulator in the mobile market in Botswana with specific examination on the licensing framework
- Section 3 considers the introduction of new regulatory topics to Botswana, specifically MVNOs and GMPCS, with emphasis on the regulatory implications for BOCRA.
- Section 4 provides a series of conclusions and recommendations focusing on the regulator's existing mandate and those potentially opened up within the new framework.



2. Regulation: The big picture of convergence

2.1 Introduction

It is undisputed that ICTs offer major transformational opportunities for Botswana. They can contribute to enhanced productivity, competitiveness, growth, wealth creation, poverty reduction and can spur the knowledge-based economy vision of as stated in the National ICT Policy (Maitlamo). ICTs provide the means by which knowledge is developed, stored, aggregated, manipulated and diffused. ICTs also enable participation in the global economy. These opportunities are well known and are not just a developed country phenomenon. Indeed the National ICT Vision of Botswana as stated in the National ICT Policy is “*Botswana will be a globally competitive, knowledge and information society where lasting improvement in social, economic and cultural development is achieved through effective use of ICT*”⁹.

Clearly, as recognized in Botswana, ICTs can have an impact on everyday lives and on general economic activity, but the opportunities only materialize fully to the extent that the regulatory framework, as implemented, supports and fosters both investment in and widespread diffusion of ICTs. Absent these conditions and the full promise of ICTs is unrealized.

In keeping in line with best practice regulation, Botswana amended its 1996 Act, which paved the way for market liberalization and established the Botswana Telecommunications Authority (BTA) as the sector’s independent regulator. The Communications Regulatory Authority Act 2012 (No. 19 of 2012), which replaced the Telecommunications Act of 1996 (No. 15 of 1996) allowed BTA to be responsible for day-to-day operations and the licensing of telecoms operators until its merger with the National Broadcasting Board (NBB) on 1 April 2013, pursuant to the Communications Regulatory Authority Act 2012. The converged regulator became known as the Botswana Communications Regulatory Authority (BOCRA) and assumed responsibility for the regulation of telecoms, internet, ICT, commercial radio, television, broadcasting, postal services and other related matters. The mandate of BOCRA is to promote the development and provision of efficient communication services, and the Communications Regulatory Authority Act 2012 gives the watchdog complete authority to license all operators, including providers of fixed, wireless and satellite services, as well as data service providers and internet service providers (ISPs). This is a noteworthy improvement in ICT sector regulation and Botswana joins a host of other countries in leading the way on regulating a converged network.

However, it is one thing for countries to make a policy decision to create an independent regulatory agency, and quite another to empower the agency to act independently and

⁹ National ICT Policy, 2005



effectively. Regulatory agencies are not created in vacuums. Inevitably, they are the products of political, social, legal and economic conditions that exist at fixed points in time in each country. Nor are these conditions static; regulatory approaches and policies change, and agencies change with them. There is no textbook for government policy-makers to quote, chapter and verse, in establishing an independent regulatory agency that will achieve their national goals.

Moreover, once regulators are named and take office, there is no blueprint and often no national precedent for how they should operate and regulate. Nevertheless, the means by which each country creates structures and implements its regulatory body is one of the most important factors in the success of its reform process. Thus, while the original regulator BTA was created and was in 2001 a model country for regulation¹⁰, this has not be the case in 2013 where several delays in sector reforms, with the last one taking place in 2006 and coupled with perceptions of government control remain at the heart of the perceived inability to effectively regulate the sector. The challenge is further heightened as BOCRA and the Government of Botswana seek to deploy Broadband as a means to speed up the uptake of the new emerging potential of a knowledge economy that comes with it.

2.2 ICT convergence and broadband – A global perspective

In the recent times, particularly in the past 30 years, the three inter-related fields of communication -- computing, telecommunications and information -- have not only grown considerably in size, but have also been converging. These changes largely driven by advances in technology, have resulted in the convergence of telecommunications, broadcasting and IT to what is now popularly referred to as Information and Communications Technologies (ICTs).

Similarly the players in the above-mentioned subsectors have also been transforming their business model in line with the technological changes as well the changing consumer demands. While the said technological convergence may have brought about a myriad of opportunities to the players and consumers it has to some extent posed certain regulatory challenges.

Traditionally, regulators have been authorizing players on the basis of distinct technologies and services they offered issuing these technologies. For example voice communications services provider were differentiated from data communications services; cellular mobile communications services providers were differentiated from fixed services providers, etc.

The above boundaries were however eroded at the advent of the IP technology and in particular the carriage of voice over IP (VoIP). Next Generation Networks (NGN) in addition represents the next phase of development of convergence in the ICT sector. NGN essentially enable consumers to receive a wide range of services over a single, IP-based network. The transition to an IP-based environment requires intensive investments as access providers and network operators must

¹⁰ See BTA review of regulation conducted for ITU in 2001.



upgrade and build new infrastructure. Further, transmission of multimedia content over both the fix and mobile networks has complicated the traditional differentiations leading to the term Broadband as a wider definition of the merging of speed, services and content within the merged technologies.

Nonetheless, despite the worldwide growth and promotion of Broadband by policy-makers, network operators, content providers and other stakeholders, “broadband” does not have a single, standardized definition, but rather refers to an ecosystem (Kim, Kelly and Raja, 2011). The term “broadband” may refer to multiple aspects of the ecosystem, including: 1) the infrastructure or “pipes” used to deliver services to users; 2) high-speed access to the Internet; and/or 3) the services and applications available via broadband networks, such as Internet protocol television (IPTV) and voice services that may be bundled in a “triple play” package with broadband Internet access.

Further, many countries have established definitions of broadband based on speed, typically in Mbit/s or kilobits per second (kbit/s), or based on the types of services and applications that can be used over a broadband network (i.e., functionality). Due to each country’s unique needs and history, including economic, geographic and regulatory factors, definitions of broadband vary widely, though many countries follow the ITU definition of speeds equal to or above 256 kbit/s (ITU, 2013. *Telecommunication/ICT Indicator Handbook*).

2.2.1 Regulatory definitions in other countries:

The struggle for definition is reflected various countries. For example,

- Australia’s goal is to make connections with speeds of 100 Mbit/s available to 93 percent of homes, schools, and businesses by 2018¹¹.
- Germany’s goal is 50 Mbit/s connections for 75 percent of households by 2014¹².
- The EU’s “Digital Agenda for Europe” calls for all Europeans to have access to connections with speeds of at least 30 Mbit/s by 2020, with 50 percent or more of households having access to speeds in excess of 100 Mbit/s¹³.
- Korea, a country where broadband connection speeds already average almost 50 Mbit/s, has set the lofty goal of 1 Gbit/s connections by 2013¹⁴.
- In Brazil, instead of speed, functionality is used in the definition as “the provision of telecommunications infrastructure that enables information traffic in a continuous and

¹¹ See www.acma.gov.au

¹² See Germany Federal Ministry of Economics and Technology, The Federal Government’s Broadband Strategy at 8 (2009)

¹³ See Digital Agenda for Europe – European Commission at www.ec.europa.eu/digital-agenda

¹⁴ See GIGAOM, As internet gets faster, Hong Kong & South Korea lead the Broadband speed derby, April 2013 www.gigaom.com/2013/04/22



uninterrupted manner, with sufficient capacity to provide access to data, voice and video applications that are common or socially relevant to users as determined by the federal government from time to time.”

Definitional disparities aside, all countries today recognize the importance that Broadband brings to a country’s ecosystem, impacting its economic output and GDP. Examples of these benefits that could accrue to Botswana include:

- enhancing the role of human capital through easier acquisition of knowledge and technical skills and thus reducing unemployment;
- improving the efficiency and productivity of enterprises;
- increasing community competitiveness by attracting knowledge-based businesses;
- Sparking new and innovative technologies, services, applications and business models.

However, policies that support the supply and demand elements of the ecosystem, as well as the absorptive capacity to develop broadband capabilities in other sectors, must all be in place in order to fully realize such benefits. It is recognized that the entire Botswana Economic Diversification Project being conducted by the World Bank is indeed aimed at looking at this entire ecosystem in considering the issues that affect both the demand and supply side of the ICT Ecosystem.

Regulatory interventions in the sector must therefore take full consideration of the wider ecosystem in the ICT sector rather than a specific technological aspect within the ICT sector. Thus layers such as speed, cost, quality of service, content generation and use, use of e-commerce and m-commerce platforms and mobile banking, and any additional technology application and service that seeks to ride on any of the infrastructures and applications possible within these new merged technologies must all be catered for within the regulatory framework applied in Botswana.

2.3 Regulating a new ecosystem – Problem statement

A technologically based regulatory framework is thus faced with the challenge of accommodating the new technologies and multiple services being offered from a single platform.

First, traditional market boundaries are increasingly blurred. Moreover, multiple services can now be offered over a single platform. Service-specific authorizations thus represent increasing regulatory burden as service providers must hold many different authorizations to provide a full range of services to their customers. This in turn hampers the service providers’ ability to take



advantage of efficiencies engendered by technological innovation and to respond to consumer demand.

Second, service-specific authorizations may create competitive advantages for one type of service provider over another if the terms and conditions attached to the authorizations are not identical. For example, given that fixed Public Switched Telephone Network (PSTN) services, mobile services, and VoIP may all be employed to provide consumers with basic voice telephony, the imposition of a large authorization fee on fixed service providers, but not on mobile and Voice over Internet Protocol (VoIP) providers, puts fixed service providers at a competitive disadvantage. Arguably, this disadvantage is not fair given that all three types of service providers offer essentially the same service from the perspective of the end user. This disadvantage also creates artificial market incentives to provide mobile and VoIP services. These incentives thus discourage investing in related infrastructure. This ultimately could undermine efficiencies in the ICT sector that would otherwise have been enjoyed had more service providers entered into the fixed voice market.

Third, there is a significant gap between the market conditions that traditional regulatory frameworks were designed to address and the market conditions emerging in a converged, IP-based environment. Regulatory approaches to authorizations that made sense in a circuit-switched environment are no longer practical in converged, IP-based networks where multiple services can be offered using a single platform. Today, there is a much greater need for neutrality and flexibility in the approach taken to authorizations than there was in the era when services were exclusively offered using circuit-switched communications networks. Regulatory frameworks in general and approaches to authorization in particular must adapt in order to respond effectively to the current characteristics of the ICT sector.

Fourth, service providers are looking for regulatory certainty in light of the significant investments they must make to upgrade their equipment and to build new infrastructure. As changes are made to the regulatory framework in response to convergence and Next-Generation Networks (NGN), regulators must be sensitive to the concerns of service providers. The transition to a regulatory framework designed to respond to an IP-based environment must be carefully managed in order to avoid discouraging service providers from investing in NGN. Regulators should also take the high cost of rolling out IP-based networks into consideration when setting the terms and conditions for authorizations.

Fifth, regulators have to realign their regulatory interventions in view of convergence. An example of this includes:

- Levelling the playing field in the wake of new “destructive” technologies. For example intervention with regard to IPTV/radio vs traditional broadcasting, VoIP vs traditional



voice, online gambling vs casino gaming, electronic information systems vs tradition paper based (print) information systems, etc.

- Addressing public policy issues such as universal service, quality of services, etc. Should interventions in this regard be applied uniformly and if so what does that potent to technological innovations.

Sixth, and of importance will be the need to realign the legal and regulatory framework with the new paradigm of technology convergence. This includes:

- Institutional structural reforms to accommodate a service orientation rather than a sector orientation
- Shifting the human perspective from the traditional “physical space” to the new “product/service space”
- Changing the regulatory framework from the traditional subsector orientation to a functional/process based that is neutral to the fading subsector distinction

Thus, the new regulatory environment will need to ensure that it considers two key factors: Firstly, the supply side regulatory issues: e.g. determining how legal and regulatory licensing frameworks may facilitate voice, video, and data offerings, spectrum management reforms, Internet interconnection, and infrastructure access policies. Secondly and while not necessarily within the core ambit of the regulator, the regulator will need to ensure that social, political and economic transactions that occur online can be trusted with issues such as privacy becoming a major criteria for uptake of content sharing and use.

2.4 Regulation in Botswana

2.4.1 Existing Framework

In line with meeting the needs of an ICT sector that has converged, BOCRA was through its line ministry issued a Ministerial Directive¹⁵ that redefined the telecommunications landscape in Botswana. The directive introduced a number of changes, which included liberalization of VOIP; liberalization of the voice international gateway and allowed mobile operators to construct their own transmission links thereby reducing their dependence on BTC for such essential facilities. Table 1 below depicts the old framework (1998 to 2006) and existing framework (2006 to date)¹⁶

¹⁵ Honorable Pelonomi Venson, MP, Minister of Communications, Science and Technology, Press Statement, Further Liberalization of the Telecommunications Sector, 21 June 2006.

¹⁶ Botswana Telecommunications Authority Consultation paper on creation of a Facilities Based Operator (FBO) License (2012)



Table 1: Licensing framework comparison

Licensing Framework of 1998 to 2006	License Duration in Years	Licensing Framework of 2006 to date	License duration in Years.
Distinct Fixed Line License	15	Combined to form public Telecommunications Operator License offering fixed, mobile, internet and data services.	15
Distinct Mobile License	15		
Distinct Data Service Provider's License prohibiting provision of VoIP	2	Combined to form Value Added Network Service License offering various forms of add-on services as may be authorized by the Authority including VoIP.	15
Distinct Internet Service Provider's License prohibiting provision of VoIP	2		
Distinct Private Telecommunications Network Operator's License	2	Maintained in the old form as Private Telecommunications Operator's License.	5

Source: BOCRA

As alluded to in the introduction section of this report, this framework has indeed served Botswana well in the past years. In doing so, the framework has led to the growth of the mobile sector with coverage being at above 90 percent. However, the coverage of new technologies such as 3G is limited and given the country's vast landscape, outside densely populated areas there is need to rely on various PTOs using different SIM cards.

A quick review of the infrastructure set up within the country shows that satellite remains expensive in Botswana. All major villages are covered by the copper local loop exchanges occurring on xDSL services. This, it is noted is a major asset for the country as xDSL is a proven and reliable solution for broadband. However, the remaining issue is that of the last mile as most of the copper loops are limited to the center of each village. The fibre optic cable backbone in Botswana is another big step in the ensuring the growth of broadband. The backbone forms a ring with connections to all urban areas and major villages. The backbone is owned by newly created BOFINET.



2.4.2 Limitations of the framework:

Despite the multiservice licensing regime, the market remains structured around vertically integrated incumbents, who simply have multiple licenses, but who continue to compete downstream with multiple service providers. This creates anti-competitive incentives in the market and requires a resource-intensive regulatory regime where the regulator is constantly required to adjust the behavior of the incumbents.

This form of multiservice authorization regime, while allowing service providers to offer multiple services under the umbrella of a single authorization, still ends up segmenting technology specific frameworks as is shown in table 1 above. Thus, unlike the unified authorization which is technology neutral. The form as used by BOCRA remains heavily centered on the technology.

Nonetheless, it is important to note that multi-service authorizations are more limited than unified authorizations; licensees are permitted to provide any of a designated set of services, but not any and all services. Multi-service authorizations are sometimes issued as general authorizations and, in other cases, are issued as individual licenses. It is not uncommon for regulators to have both general authorization regimes and individual license regimes for their multi-service authorizations. Individual multi-service authorizations are often issued using a non-competitive individual licensing process. Indeed, as observed in Botswana, while there has been a shift to signal convergence, through a horizontal licensing framework as used through the mixed form of multiservice authorization regime, it remains vertically organized. This is because; operators have simply tended to acquire multiple licenses thus preserving the vertically integrated entities they operated before the introduction of a multiservice regime.

In addition technological convergence in the telecommunications and broadcasting markets is hastened by the growth of broadband networks, since the higher speeds and larger capacities of broadband create new opportunities for operators to offer an array of services, including voice, data, and video. The latest move by the Government was to create an entity called BOFINET that will now manage the government investment in the East African Submarine System (EASSy) and West African Cable System (WACS). This alludes to the need to structure the licensing framework in a manner that conforms to the now realigned ICT sectors which are viewed as one.

The proposed introduction of an FBO license into the current framework

Contrary to BOCRA's position that the existing framework allows for service and technology neutrality, the existing framework is still very much based on technology. Its only difference is that it has suggested which type of services can be offered within each license category. Thus, you still have a state-owned public telecoms operator (PTO) and privately owned PTOs. The mandate



of the Facilities Based Operator (FBO), according to BOCRA would therefore be to rollout infrastructure and service PTOs and VANS. To cure the challenge of what happens to the PTOs who also have infrastructure; BOCRA suggests that it would “slightly” modify the existing conditions on the PTO license by allowing the PTOs to roll out the backbone infrastructure, as is currently the practice. This they argue would serve as a “safety valve” should the FBOs not be able to service PTOs in certain areas. PTOs and Value Added Network Services (VANS) provider would thus continue to exist in their present form.

The current proposed introduction of an FBO license seems to suggest that the regulator is not seeking innovative ways to adequately fix the gaps of the existing regulatory framework. The introduction of an FBO license instead creates further inconsistencies for future market needs. More so, it could be argued that the license is therefore created to serve the interests of BOFINET, rather than to facilitate competition in the sector by ensuring that there are clear license categories that allow any player to operate in the market of its choice. A framework that creates consistency and confidence, not only in the backbone infrastructure market but that meet the demands created by a converged technology, is therefore needed. It is noted that this review of the sector is aimed at addressing this gap.

More importantly, the requirement for growth in broadband in the country and the potential new array of services that can be offered over the infrastructure requires a new framework that will not to give any importance to the technology used. For example, two of the largest broadband network operators in the world, Comcast and Time Warner, began as cable television (TV) operators, but now derive substantial revenues from Internet and voice services, as well as from pay TV, particularly through their “triple-play” packages (Kim, Kelly and Raja 2011). Broadband also supports the expansion of markets and competition as well as helping to reduce prices, improve the efficiency of service provision, and increase the variety of offerings for subscribers. To facilitate the supply of emerging wireline and mobile broadband networks, an enabling licensing framework is necessary.

Traditional, service-specific regulatory frameworks as exemplified in Botswana have typically required separate licenses for wireline, wireless, and broadcasting networks as well as for different types of services. Thus, in many instances, operators have been prohibited from offering services outside their traditional, rigidly defined license category that is centered on a particular technology. Thus, even new services such as Global Personal Mobile Communication by Satellite (GPMCS), and Mobile Virtual Network Operators (MVNOs) become increasingly difficult to introduce to markets where technology preference is a criterion for the license category.

The result is that with the introduction of broadband, new digital broadband technologies make it possible to offer several types of services hitherto seen as peripheries of either telecoms or broadcasting. For example, Internet Protocol television (IPTV) was restricted in the Republic of



Korea until the IPTV Business Act of 2008 permitted telecommunications operators to offer television programs in real time over their broadband networks¹⁷.

The drawbacks of the existing framework as used by BOCRA can be summarized as:

1. It limits the concepts of open access as it remains technology centered
2. It becomes difficult to incorporate changes in the sector without altering the existing licensing framework
3. The framework is unable to accommodate GMPCs and MVNOs introduction without the introduction of specific license categories. A key recent example is the proposed introduction of a Facility Based Operator License (FBO) suggested in 2012 by BOCRA.
4. Broadcasting regulation and several other new technologies struggles to fit in within the ambit of this framework.

2.5 The shift to a Unified Licensing Framework

The natural regulatory response to the above-mentioned changes is to migrate to a unified and technology neutral licensing regime. Regulators around the world consider the migration to the new licensing framework as the best mechanism to not only addresses the regulatory challenges associated with convergence but also as a means of harnessing the new opportunities and realities created by broadband¹⁸.

As regulatory frameworks become more established and communications markets become more mature, the need to reduce regulatory intervention at the point of market entry is necessitated. Instead, greater reliance is placed on general conditions, ex post regulatory remedies and industry self-regulation in the areas previously covered by individual license conditions. Unified or Converged licensing objectives can be summarized as follows:

- Encouragement of the growth of new applications and services;
- Simplification of existing licensing procedures to ease market entry and operations;
- Regulatory flexibility to address market and technological developments.
- Efficient utilization of network resources, so that individual networks may be used to provide a broad range of ICT services.
- Encouragement of a full range of operators, including large scale and micro entrepreneurs.

¹⁷ World Bank, Broadband Strategies Toolkit at www.broadbandtoolkit.org

¹⁸ *ibid*



To ensure that the transition to a converged licensing regime fosters a level playing field among all competitors, countries have introduced new licensing approaches and opted for different models. These include:

- Distinguishing between facilities-based and service-based licensees;
- Distinguishing between network facilities providers, network service providers, application service providers and content application service providers;
- Unifying licenses to encompass all ICT services or defined license clusters under a single licensing classification;
- Establishing a general authorization process, eliminating licenses except for scarce resources such as spectrum and numbers.

The main segments of a unified licensing framework are thus usually categorized as:

- **Network facility Provider (NFP):** the provision of any element or combination of physical infrastructure used principally for, or in connection with, the provision of Content services and other Application services, but not including customer premise equipment;
- **Network Service Provider (NSP):** a service for carrying information in the form of speech or other sound, data, text or images, by means of guided or unguided electromagnetic energy, but not including services provided solely on the customer side of the network boundary;
- **Application Service Provider (ASP):** the reselling of electronic communication services to end users; and
- **Content Service Provider (CSP):** a service offered for sound, data, text or images whether still or moving except where transmitted on private communication.

These efforts generally have three key elements:

1. The introduction of the principles of technology and service neutrality and open access
2. The establishment of greater flexibility in key aspects of licensing and authorization frameworks, particularly the authorization of a wide range of networks and services under a single license.
3. Greater reliance on broad competition law and regulation, as the historic restrictions contained in licenses and authorizations are progressively reduced.

The principle of technology neutrality in the licensing framework allows any form of communications infrastructure to be used to provide any type of communications service that it is



technically capable of providing including VoIP. These authorizations are technology- and service-neutral. They allow licensees to provide all forms of services under the umbrella of a single authorization, using any type of communications infrastructure and technology capable of delivering the desired service. In most countries, unified authorizations are issued as individual licenses. However, in some countries, the process for issuing the unified authorization blends aspects of general authorization processes and competitive licensing regimes. These hybrid processes can best be described as non-competitive individual licensing processes: while applicants do not compete for a limited number of authorizations, they must meet a variety of criteria to qualify for a license and their applications are subject to close regulatory scrutiny

2.5.1 Open Access Principles and a Unified Licensing Framework:

Recognizing that broadband is an evolving phenomenon with constantly changing and expanding demands; and in order to create enabling conditions for an advanced, universally accessible information infrastructure that promotes social and economic inclusion, it is necessary for the regulatory regime to address the structural constraints in the market arising from the dominance of a number of vertically integrated operators. Re-structuring the market to enable greater wholesale access to networks by service providers, will go a long way to creating a more competitive services sector, which is likely to enhance quality and drive down prices. The existing reports on Broadband commissioned by the regulator attest to the need for a shift in the regulatory regime to provide a more holistic and long-term solution to technology convergence and the use of broadband. The key principles precipitated by the unified licensing framework are:

- **Openness:** at the infrastructure level, with open access for multiple services providers who are enabled to compete on shared platforms; at the level of government and its regulatory agencies, commitment to open governance and open data; openness in policy formulation through consultation and public participation.
- **Service and technological neutrality:** no preference is given to any particular type of service or technology, while ensuring the use of common standards and protocols that enable interoperability;
- **Universality:** universal access to broadband services through even more provisioning of services, including a focus on services in underserved and underserved areas and communities;
- **Equality:** address the digital divides between those with the resources and capabilities to access and optimally use the full range of broadband services



- **Efficiency:** Within a competitive market, enabling the sharing of infrastructure to avoid unnecessary duplication;
- **Transparency and accountability:** by sector institutions and operators, policy and regulatory certainty to enable public and private investment;
- **Innovation:** creating conditions for innovation throughout the ICT ecosystem from policy and regulation to services and applications, and from networks to users and skills and capacity building;
- **Complementarity:** leveraging top-down coordination and bottom-up initiatives, public and private resources, fixed and wireless technologies, and different tiers of government; and
- **Future-proof:** ensuring that policy choices are flexible enough to accommodate technological progress, neutral enough to withstand technology and market shifts and resilient to value dilution.

2.5.2 Examples of countries using unified licensing framework:

Malaysia¹⁹:

Enacted in 1999, Malaysia's Communications and Multimedia Act (CMA) established a regulatory framework explicitly designed to reflect and accommodate the phenomenon of convergence. The CMA introduced a technology- and service-neutral licensing regime for telecommunications and broadcasting that abandoned conventional service-specific classifications for four generic classifications:

- *Network Facility Providers (NFPs)*, which include owners of satellite earth stations, fibre optic cables, communications lines and exchanges, radio communication and transmission equipment, mobile communication base stations and broadcasting towers and equipment;
- *Network Service Providers (NSPs)* for entities that provide basic connectivity and bandwidth to support a variety of applications;
- *Application Service Providers (ASPs)* for licensees that provide particular functions such as voice services, data services, Internet access services, IP telephony, and other transmission services; and
- *Content Applications Service Providers (CASPs)* – a special subset of applications service providers – including traditional broadcast services and services such as online publishing and information services.

¹⁹ Malaysian Communications and Multimedia Commission (MCMC) –www.skmm.gov.my/



The services falling under these categories are further subdivided into services requiring individual licences, services requiring class licences, and exempt services. The process for obtaining class licences involves a lower level of regulation than individual licences, which require ministerial approval. Class licences require registration. Licensees are allowed to hold more than one type of licence at a time.

The national regulatory authority, the Malaysian Commission for Multimedia and Communications (MCMC), began migrating telecommunications and broadcasting providers to the new regime in 1999. A total of 56 categories of licensed services and 24 categories of licensed facilities were reorganized into the four generic licensing classifications established by the CMA. The migration process was completed in 2002.

India²⁰:

India introduced the Unified-licensing framework in 2003. With the introduction of unified access licensing, existing Basic Service Operators (BSOs) and cellular carriers could either continue to operate under the old licensing regime or migrate to the new regime. Operators migrating to the Unified Access Service Licensing (UASL) regime continued to provide wireless services over existing allocated spectrum, with no additional spectrum allotted under the migration process. No additional entry fees were charged for cellular carriers to migrate to the new UASL licence. BSOs, however, were required to pay an entry fee for migration. The BSO entry fee for a particular service area is based on the difference between the entry fee paid by the fourth cellular mobile service provider in that area and the entry fee already paid by the BSO to provide its existing services in that same area. License fees, service areas, rollout obligations and performance bank guarantees under the UASL regime are identical to those specified in the licence granted to the fourth cellular mobile service provider.

Tanzania²¹

The unified licensing framework in Tanzania is also similar to that of the other Eastern African Countries: Uganda and Kenya though the latter two countries do not distinguish between Network Service License and instead have a tiered framework on the Network Facilities Provider license as is explained later on.

In Tanzania the legal framework for the ULF is provided under the Tanzania Communications (Licensing) Regulations, 2005. General provisions on licensing issues and licence categories are provided under the said Regulations. The Schedule to the Regulations provides for the following four licence categories.

- *Network Facility Licence (NF)*: Under this category a licensee is authorized to install, own, control and provide access to electronic communications facilities, like fixed links, radio

²⁰ Telecom Regulatory Authority of India – www.trai.gov.in

²¹ Tanzania Communications Regulatory Authority (TCRA) – www.tcra.go.tz



communications transmitters, satellite station, submarine cable, fibre /copper cable, towers, switches, etc., to other licensed operators on commercial bases. Facilities established/to be established for the purpose of self support (private usage) or sharing with other providers to provide Applications Services are exempted for this licence.

- *Network Service Licence (NS)*: This licence category allows a licensee to operate and maintain public electronic communication networks with various technologies (like CDMA, GSM WCDMA, WLL, ASDL) that involve intelligent network platform signalling control, traffic distribution switching translation and quality of services control. Examples of network services include mobile service, fixed lines services, bandwidth services and broadcasting distribution services.
- *Application Service Licence (AS)*: An Application Service Licensee is responsible for the provision of electronic communications services to end users. Access to these services can be through establishment and operations of private facility and network or procurement and reselling of services from licensed facility or/and network service providers. Examples of these services include Internet services providers, virtual mobile provider, payphone services, fixed/mobile service.
- *Content Service Licence (CS)*: The licensee is similar to Application Service licensee except that the licensee is responsible for provision of content services such as satellite broadcasting, broadcasting terrestrial free to air TV, terrestrial radio broadcasting, subscription TV and other broadcasting service.

Kenya²²:

Kenya operates under the Unified licensing framework as with the regional regulators of Uganda and Tanzania. Kenya's unified licensing framework is modeled around four key segments

- Network Facilities Provider (NFP) – who shall own and operate any form of communications infrastructure (based on satellite, terrestrial, mobile or fixed). This license has three tiers based on the reach of the proposed infrastructure in country.
 - Tier 1 –Country wide license
 - Tier 2- Regional license
 - Tier 3- Administrative unit or one area license
- International Network Facilities Provider – As the name suggests this license provides licenses for
 - Submarine landing cable license
 - International Gateway license
- Applications Service Provider (ASP) – to provide all forms of services to end users using the network services of a facilities provider

²² Communications Commission of Kenya – www.cck.go.ke



- Contents Services Provider (CSP) – to provide contents services such as broadcast (TV& Radio) material, and other information services and data processing services etc.

European Union (EU)- A general authorization regime²³

The EU uses a unified licensing framework in the form of what is called a general authorization regime established by the European Union (EU) Authorization Directive in 2002, as amended in 2009. Under that regime, a provider may offer any type of electronic communications network or service with a simple notification to the relevant national regulator. No license application or approval process is generally required.

2.5.3 Unified Licensing Framework for Botswana

In proposing a framework for Unified Licensing in Botswana, the following aspects will need to be considered:

- . The mapping of existing service specific licenses into Unified Licensing model
- . The scope of Unified License
- . The limits of Unified licensing
- . The desired level of regulation
- . License fees
- . Implementation strategy for Unified Licensing Regime: Phased or one-step implementation.

Keeping the above in mind, several options on how to shape the new licensing regime will need to be considered taking into account the Botswana environment. These options are varied in terms of services to be covered by license, types of licenses and time-schedule for implementation. A separate stakeholder discussion questions paper is attached which seeks to gather the input of stakeholders on the above framework, prior to putting definitive license procedures and durations to the process.

The suggested key principles to manage this are:

- . There shall be no distinction between say mobile or fixed services, satellite or terrestrial services, data or voice services, etc. Instead licensees will be categorized based on whether they are Network Facilities provider, Network Services provider, Application Services provider, or Content services providers.
- . Direct interconnectivity between all network operators will be permitted.
- . The framework shall also be based on the principle of technology neutrality, which permits any form of communications infrastructure to be used to provide any type of communications service that is technically capable of providing.

²³ European Commission – Telecom Rules – A Digital Agenda for Europe – www.ec.europa.eu



- Operators that fall in more than one category will be expected to obtain applicable licenses of all the categories in which they operate.
- Cross-subsidization between the various license categories shall not be allowed. Firms with multiple licenses shall be required to structure their operations.
- With the exception of areas where there exist natural limitations say in spectrum availability, the market will determine the number of licensee in all other areas.
- The migration of existing players from the current framework to unified licensing will be guided by the need to ensure that the existing licences are converted into the new licensing framework on the same or more favorable terms and conditions.
- In addition and for purposes of ensuring a level playing field the framework will in general be applied to both existing and new licensees and in a manner that ensures that none of the parties is disadvantaged.
- By adopting this framework the regulator will not vary in any way the existing timeframes for the expiry of the existing licenses nor interfere with the existing frequency and numbering assignment.
- Any new block frequency assignments will be subjected to a frequency access fee to be determined through either regular spectrum auctions and/or economic value analysis of the particular spectrum block to be availed based on ITU spectrum pricing recommended methodologies. Other relevant considerations shall also be taken into account in this spectrum pricing process.
- Spectrum fees shall be dependent on the amount of spectrum, locality, the coverage of the spectrum (regional, localized or national) and the offers made in the bidding/evaluation process.

It should be noted that no license fee and duration is suggested at this point. These criteria will have to be factored in internally. Thus the overall framework suggested under the ULF would categorize between:

- Network Facilities – the provisioning of any element or combination of **physical infrastructure** used principally for carrying Network Services, Content services and other Application services. Customer Premise Equipment are not included in the description of network facilities. The infrastructure may include fixed links, radio communications transmitters, satellite station, submarine cable, fibre/copper cable, towers, switches, base stations. The facilities are for own use or for availing to other licensed operators on commercial basis.
- Network Services - a service for carrying electronic information in the form of speech, sound, data, text or images, not for broadcasting purposes. The services are carried over Network Facilities and are delivered to end users.



- Application Services – provisioning to end users, services which deliver particular functions based on voice, data, content, cloud computing and electronic commerce. Applications provide certain functions and capabilities. Resellers of Network Services to end users as well as Mobile Virtual Network Operators fall under this category. The reseller services may include voice services, data services, Internet services, IP telephony and other services to end users. Application services are delivered over Network Facilities.
- Content Services – provisioning of content material solely for broadcast (TV and radio) and other information services. The content is carried over Network Facilities. Subscription TV falls under this category.

2.6 Summary

The shift to a unified licensing framework requires more than just shifting the existing licenses into various categories. It requires planning to ensure that the shift to a horizontal from vertical framework is truly achieved. For BOCRA the key advantage to this framework is the flexibility it provides in ensuring that the new regime can accommodate future technological and market changes.



3. NEW REGULATORY TOPICS: MVNOs AND GMPCS

As discussed in the previous chapter, the prospect of new services and technologies is made increasingly possible due to the convergence of ICT. This section provides a review of MVNOs and GMPCS and considers the economic and regulatory implication of their introduction in Botswana.

3.1 INTRODUCTION

As noted in earlier sections of this report, Botswana already has a robust mobile market with three mobile operators namely: Mascom, Orange and beMobile. The question for BOCRA is thus, should Indirect Access (IA) be introduced through MVNOs in Botswana? If IA is introduced, there will be another layer of competition in the market, whereby customers can choose to make certain calls (typically national or international calls) through an IA operator and be billed by this operator for these calls. In this case, the customer still pays their existing operator or service provider for subscription and other calls. MVNOs will be a yet further type of competitor.

In order for MVNOs to offer services to customers, they will need to conclude commercial agreements with at least one mobile operator to gain access to that network. If commercial agreement cannot be reached, BOCRA may be asked to intervene, potentially to decide whether access should be allowed, on which networks and at what price. It is encouraged that BOCRA will go by international regulatory best practice and allows clear preference for industry to reach commercial agreements.

If commercial agreements cannot be reached, whether BOCRA would intervene would be critically dependent upon an assessment of a number of economic and legal considerations, which cannot be fully explored in this report. From an economic perspective, BOCRA would take into account the competitiveness of the mobile market and the impact of MVNOs on promoting competition in the market. If regulatory intervention is justified, BOCRA's presumption is that the price of access should be based on 'retail-minus'²⁴. (that is: the MVNO charge would be the retail price after deducting the costs of elements of the service that are now to be supplied by the MVNO and no longer by the network operator). This is a question for discussion rather than a presumed fact; nonetheless it is the opinion of the authors of this report, that this is a preferred best practice.

²⁴ This pricing methodology is used by most regulators. This report will not delve into the details of the methodology.



The report factors in that ULF framework is best suited for the inclusion of MVNOs. The report sets out findings of preliminary views on the regulatory issues under other jurisdictions such as that of India, South Africa, Malaysia and the European Union that might apply to MVNO requests for access.

In addition, there are a number of technical and implementation issues on MVNOs. There are a number of ways in which MVNOs may be implemented, and they may require different levels of use of the mobile network operator's infrastructure. These technical issues are not discussed herein and would require each mobile operator to present their views on the same once it has been agreed that MVNOs would be another layer of service provision. Indeed, it is noted that the technical issues have cost implications to the operators and therefore would require further discussion on the same.

For GMPCS the issue is made less complicated as the ITU carved out a Memorandum of Understanding (MOU), which was signed by member states in July 1997 at Geneva²⁵ which transitioned member states to apply GMPCS within the newly created licensing frameworks of technology neutrality.

In summary therefore, this section presents views on:

- The types of services an MVNO might offer and the number of potential MVNOs that might seek to enter the market;
- The possible benefits to competition and consumers of MVNOs;
- If commercial negotiations to enable MVNOs fail, whether there is a case for regulatory intervention;
- If regulatory action is justified, on what basis;
- The types of technical implementation which might be feasible for MVNOs (though only at initial stage conversation)
- And finally the existing framework to accommodate GMPCS

3.2 MVNOs

The introduction of MVNO is seen as a natural progression towards enhancing free market principles and contributing to the efficient use of existing telecommunication infrastructure. The mobile value added services are still evolving. While the potential of mobile technologies is undeniable, new value added services are constantly emerging widening the range and types of service offerings and pricing plans, the likely applications and usage. Correspondingly, the possible types of services an MVNO might offer and the role they would play in the emerging market would also expand. It is observed that the entry of MVNO in the mobile market raises the

²⁵ GMPCS Memorandum of Understanding (GMPCS MOU) – www.itu.int/gmpcs



level of competition by providing consumers with a wider choice of service providers, a wider range of innovative value added services and more competitive pricing plans.

3.2.1 Business Models

The different business models in the MVNO market are based on how the value chain is restructured. Therefore, four main business models that emerge are: Branded Reseller, Light-MVNO, Full-MVNO and Network enablers

- **Branded reseller** is the lightest MVNO business model, where the venture just provides its brand and, sometime, its distribution channels. While the mobile network operator (MNO) provides the rest of the business, from access network to the definition of the mobile service offer. This is the model that requires the lowest investment for a new venture, therefore the fastest to implement. However, most of the business levers remain with the network provider (MNO or MVNE). Therefore, the new venture has a very limited control of the business levers and value proposition of the service.
- **Full-MVNO** is the most complete model for a new venture, where the mobile network operator just provides the access network infrastructure and, sometimes, part of the core network, while the new venture provides the rest of the value chain. This MVNO business model is typically adopted by telecom players that could gain synergies from their current business operation.
- **Light-MVNO** is an intermediate model between a branded reseller and a full MVNO
- **Network enablers**, typically known as Mobile Virtual Network Enablers (MVNE), this is a third party provider focused on the provision of infrastructure that facilitate the launch of MVNO operations. An MVNE can be positioned between a host MNO and an MVNO venture to provide services ranging from value added services and back office processes to offer definition. MVNEs reduce the entry barriers of MVNO ventures, given that an MVNE aggregates the demand of small players to negotiate better terms and conditions with host MNO. They pass on some of these benefits to their MVNO partners. Moreover, the all-in-a-box approach to launch an MVNO through a MVNE has accelerated, even more, the explosion of the MVNO market. Some MVNE models are also called Mobile Virtual Network Aggregator depending on the range of services offered or whether they aggregate different host MNOs. MVNE models range from telco-in-a box offering, where the MVNE just offers core network, value added services and back office services to full MVNE

The key factor on which the MVNO concept depends for its implementation is the acceptance by the mobile networks of mobile calls transmitted by (or to) customers who are 'owned' by another operator. Technically and operationally, this would be arranged by the MVNOs' issuing their own 'smart cards' in place of those issued by the mobile network operators. These smart cards - SIM (Subscriber Identity Module) cards - contain the key functions identifying the customer to the



network. They act as a passport for the customer and their handset: provided a mobile network operator recognizes them.

In assessing whether regulatory action might be justified, BOCRA is encouraged to consider both the benefits to consumers of mobile services that might result from MVNOs and the effect on existing operators and their customers. BOCRA would then follow the same process as it has adopted in its consideration of other mobile issues. It will define the market; review the competitiveness of the market; assess how far and in what ways MVNOs could be expected to add to competition at either the network or the service level, or both; how they might reduce any barriers to effective competition; and what competition there might be between MVNOs.

3.2.2 The MVNOs in Africa and what they might offer

This section sets out the current understanding of what sorts of services MVNOs would offer to the customers; what sorts of organizations might wish to act as MVNOs; and what sorts of facilities they would require from the mobile networks. In providing the views below, the report is cognizant that MVNOs are a comparatively new concept and those ideas and approaches are evolving constantly.

In Africa, MVNOs form less than 1 % of the MVNO global companies. The analysis below²⁶ provides a snapshot of the MVNO market in Africa as at 2013.

Table 2: MVNO Market in Africa

<p><u>Morocco</u></p> <ul style="list-style-type: none"> • In February 2012, State Owned postal service, Poste Maroc, announced plans to launch an MVNO- but it has not yet done so.
<p><u>Cameroon</u></p> <ul style="list-style-type: none"> • “Set Mobile”- has been signing subscribers since December 2011, and went live in July 2012. It has 200,000 subscribers. They use Orange Cameroon network. • SMS Mobility – was launched in December 2012. Uses Camtel’s Network and positions itself as a data MVNO.
<p><u>Senegal</u></p> <p>Tabubae- was launched in March 2011, it is a sub brand of Expresso</p>
<p><u>South Africa</u></p>

²⁶ Data collected from the MVNO Landscape review at the MVNO conference in South Africa 2012. Data sourced from GSMG-Global.com January 2013.



<ul style="list-style-type: none"> • Virgin Mobile²⁷ – Launched in 2006 as a JV between Virgin Group and Cell C. It uses Cell C network and has 400 thousand subscribers as of August 2012 (80% on prepaid) • Red Bull Mobile – Launched in February 2011. Uses Cell C network and is owned by the energy drink manufacturer. • Econet Wireless- Launched in 2009 and uses Cell C network. Has a prepaid SIM offering discounted calls to Lesotho and Zimbabwe- ExPat offering. Has 500,000 SIM sold as of September 2010 • Hello Mobile – Has attractive international rates. Uses Cell C network • 8.ta powered by Telkom – Launched in October 2010. No longer an MVNO. Launched as a roaming MVNO on the MTN network • AppChat – Plans to launch in 2013. Has Mobile VoIP/OTT Pay
<p><u>Madagascar</u></p> <ul style="list-style-type: none"> • Primarily an ISP, blueline recently launched a mobile service as an MVNO

Where MVNOs have been implemented, they have been seen to offer:

- Expanded choices - with MVNOs, the customer would have a wider range of organizations offering them a complete mobile service;
- Potentially wider range of services: use of the IN (Intelligent Network) functionality in the MVNOs' networks may enable them to provide a wider range of services than those available from the mobile networks themselves;
- Possibly lower retail prices - exactly how much lower would depend on the one hand on the terms and conditions for the payments by MVNOs to the mobile networks for the connection to their systems and the use of the systems for calls; and on the other hand on how much more efficient MVNOs are in procuring those elements of the service where they substitute their facilities for those of the network operators.

In addition, the MVNO business model can bring different types of opportunity for other business in the market depending on the assets a company can exploit. Moreover, the type of opportunity that your company is able to exploit depends on the industry it belongs to. For example:

- If you are a retailer you can offer mobile services through an MVNO as a new product category or as part of a loyalty program (e.g. Tesco Mobile in UK and Ireland and Carrefour Mobile throughout Europe).

²⁷ For further reading see: http://www.pyr.com/pa_feb23_savm.htm



- If you are an MNO you can expand in your home market with a second brand through an MVNO to serve new segments (e.g. UZO in Portugal by MTN) or expand to foreign markets through an MVNO and/or MVNE offering (e.g. KPN in Spain and France as a MVNE and with its own MVNO brands such as *simyo* and *blau*).
- If you are a Fixed/Broadband operator you can offer mobile service through an MVNO as a step to build 4-play and convergent solutions (e.g. TELE2 throughout Europe and Ono in Spain).
- If you are a long distance operator you can offer mobile services through an MVNO to immigrant segments that would benefit from low-rate international calls.
- If you are in media or other industries, such as sport clubs, with a strong brand and community you can offer mobile services through an MVNO as a new business line to increase the value of your clients leveraging your current positioning (e.g. M6 in France and Football Club Porto in Portugal).

3.2.3 What will the MVNOs require of the mobile network?

As discussed in earlier sections of this paper, there is a range of ways in which MVNOs can implement their services: from the minimum use of the mobile networks facilities to almost total dependence on them. This would be mirrored by the gradual increase in the number of elements of the mobile networks' facilities that MVNOs might wish to have supplied by the mobile networks rather than supply themselves. Ultimately, this could extend to some MVNOs' being totally dependent on the facilities provided by mobile networks - at which point, from a consumer's point of view, these MVNOs would scarcely be distinguishable from service providers or the network operators themselves.

At a minimum all MVNOs will require is the use of the radio elements of the mobile networks and such fixed parts of the mobile operators' networks as are necessary to route calls between the radio elements and the first convenient points at which calls can leave (or join) the mobile networks en route to (or from) the facilities of the MVNOs. (This minimum amounts to no more than, firstly, the radio transmission link, its control functions and the mobility and management functions that keep track of exactly where mobile handsets are located so that calls can be delivered to them; and secondly, some transmission and switching facilities needed to link the radio facilities to the points of interconnection either with the MVNOs' systems direct, or with transit carriers).

At the other extreme is the maximum use of the mobile operator's facilities and minimum investment by the MVNO. Calls from MVNOs' customers will be handled virtually entirely by the mobile networks as if in fact they were calls from subscribers to the mobile networks. In particular all the verification operations would be carried out by the mobile operators - whose databases



would have to be geared to receive process and supply data concerning the MVNOs' customers as well as their own. (In the same way, the routings used for the transport and delivery of the calls after leaving the mobile networks to reach the terminating Operators would be exactly those chosen for the calls originated by the mobile networks' own Customers. Virtually all that would be different is that the billing and service performance information would have to be transferred from the mobile operators to the MVNOs).

Between these extremes there is a range of varying degrees of use by MVNOs of the mobile networks facilities and corresponding use of, and investment in, their own facilities. One such permutation could be that some MVNOs set up their own verification facilities to check that calls are acceptable for onward transmission, but the onward transmission would be the same as for calls made by the networks' own customers. This is the arrangement for the present system of international roaming for subscribers of other countries' networks. Here the databases of the visited networks and the networks that own the visiting subscribers already exchange this information, but the calls are handled by the visited networks in their usual manner. A completely opposite alternative approach would be for the verification to be carried out by the mobile operators' facilities but for the calls to be routed to MVNOs for onward conveyance and termination. Clearly if MVNOs are accepted, each will want to specify and agree the range of services to be provided by the mobile networks and reflect this in the contracts, along with an appropriate set of charges.

3.2.4 MVNO Key Requirements: their own issue of SIM cards with their own Mobile Network Codes (MNCs)

This report does not seek to delve into the technical issues in the implementation of MVNOs²⁸. However, it is important to take note that an integral part of any GSM system is the SIM card which contains the information that identifies the user to the network. By exchanging this information with the mobile system when the handset is switched on, the handset is readied to make or receive calls by generating and receiving radio signals. These radio signals are used to make contact with a base station as required. Without a SIM card, a handset can usually make only emergency calls. This is detailed in Annex A. The key information required for this identification is contained in the IMSI (International Mobile Station Identity) code which allows the mobile network to check that the handset/ SIM card is used by a customer who has a contract with the network. This IMSI number is entirely separate from the public telephone number through which the customer is contacted for incoming calls and billed for outgoing calls.

The IMSI code is also more fully explained in the ITU MVNO discussion found on its website. In summary, it consists of fifteen digits. The first three identify the country to which the SIM card (and as at present the issuing network) belong - they make up the Mobile Country Code (MCC). The next two are the most important for the purposes of this consultation document and identify

²⁸ Further information can be accessed from www.prepaidmvno.com or www.telecomspace.com



the network issuing the SIM card - they are called the Mobile Network Code (MNC). The last ten digits identify the specific customer. The allocation of MCCs is governed by the International Telecommunications Union (ITU). For example, in the UK, MNCs are allocated by the DTI. As with most numbering schemes, these numbers are a finite resource.

3.3 Regulatory issues around MVNOs

3.3.1 Framework

As recommended in earlier chapters of this document, the regulatory framework that offers a convergence model with no respect to technology is best suited for the MVNO. The unified regulatory framework presented in the previous chapter is applied in the MVNO market in several countries.

3.3.2 Commercial Agreements versus regulatory intervention

If the MVNO concept is to be translated into services, there has to be an agreement between MVNOs and mobile networks. As with best practice regulation, we recommend that any such agreements should be the result of commercial negotiation. The key question is whether, in the absence of commercial agreement, there needs to be regulatory intervention so that would-be MVNOs can have access to existing mobile networks. If there were seen to be such a need, then on what terms and conditions should the services be supplied? The rest of this section considers such parallels as exist for this sort of service. It briefly reviews some of the economic and a competition issues that must be addressed, and considers what powers BOCRA has which bear on these issues.

Question 1: when are operators' SIM cards recognized by mobile networks?

There are two areas where mobile networks recognize or may recognize SIM cards which are not their own. The first is roaming by the subscribers of foreign mobile networks on Botswana mobile networks. Such agreements are routinely arranged for the joint benefit of customers of both operators and both networks. The arrangements are purely commercial and depend on negotiations between operators. They are not mandatory. There is in fact every incentive for networks to reach this sort of commercial agreement as this valuable traffic is purely additional. The second potential category of roaming is the Third Generation (3G) of mobile service and systems.

Question 2: Are there obligations on the networks to provide MVNO service?

The answers to the key questions of the principle of an obligation on mobile networks to supply MVNO and the basis for charges may in part depend on how the service is defined; that is, which of the range of forms MVNO services can cover is the subject of any dispute.

Some elements of the service are clearly akin to interconnection: particularly the conveyance of the call (once accepted) over the fixed (non- mobile radio) parts of the mobile operators'



networks. But the status of others is not clear and it is part of the this paper to bring out the issues of definition of what an MVNO service is, and the elements necessary to implement it, in order to develop understanding of what parts of the regulatory regime may be relevant.

To simplify discussion of a complex issue, it seems best to start with the minimum form of MVNO: that is the form with minimum use of the mobile operators' facilities, and the maximum use of the MVNOs' own facilities. This has the merit of focusing the question on the common factor to all forms of MVNO services. This is the access to the air segment and the facilities necessary firstly to register that the MVNO SIM cards are backed by agreements on their recognition; and secondly to handle the calls according to the agreement - which in the simplest case would require the calls to be routed out of the mobile networks at the earliest economic point.

This common element - the access to the radio and other facilities necessary for handling MVNO calls - has some similarities with access to the local loop fixed networks. This is a current source of discussion by National Regulatory Authorities (NRAs) under the ITU.

Question 3: What are the economic issues that BOCRA needs to take into consideration?

The key initial question for BOCRA to address in preparing an economic assessment on which to base conclusions on whether MVNO access should be mandatory is to define the market and its competitiveness. If the market for mobile services is effectively competitive then we might presume that intervention to require access to be provided to MVNOs is not necessary or appropriate; BOCRA would expect players in the market to be able to come to commercial agreements on terms of access. If access is not provided there would be a presumption, in a competitive market, that entry would not be efficient.

A requirement to allow access by MVNOs will not increase the number of competitors in the provision of underlying airtime because the MVNOs will not have their own spectrum. There may be benefits, however, from the entry of MVNOs in the form of increased competition between the existing network operators. This could occur if MVNOs are able to reduce barriers to effective competition between the existing four network operators.

The barriers to competition include the existence of switching costs which make it difficult for customers to change operators. An MVNO may undertake the switching between the underlying networks rather than the retail customer, who would continue to obtain service via the MVNO. Competing MVNOs could have lower network costs of switching from one network to another than a retail customer. For example, they may have lower costs of gathering information and would be able to spread these over a large number of customers.

This may induce more intense competition between the networks (to supply to the MVNOs). However, its impact on retail customers would clearly depend on the intensity of competition



between MVNOs, although if barriers to entry as an MVNO are low then competition may be relatively strong.

Other regulatory issues needing agreement in light of the above are: If MVNO services were defined as interconnection services, then, there would then be an obligation on the networks to negotiate on the provision of services. In the event of a dispute over this negotiation, the issue would be referred to the BOCRA as set out in the Act. However, in the light of the consideration given to this issue in many NRAs, the key feature of MVNO operations, recognition of a SIM card, is not a service which falls under the category of interconnection but rather MVNO services are viewed as the equivalent of roaming services. Requests by MVNOs for access to operators' networks may also fall within powers envisioned within BOCRA regulations.

Question 4: What should be the basis of charges if MVNOs are required?

The discussion in this section is deliberately placed here as this may later become a concern. It is noted that BOCRA has not formed a clear opinion itself, from either economic or legal analysis, on whether (if commercial agreement cannot be reached) there are any ground for mandating access to mobile networks for MVNOs. An obligation may however be one of the outcomes and thus it seems fair to also raise this issue here. This does not prejudge the principle of the obligation to supply MVNO services.

Research from other National Regulatory Authorities (NRAs) shows that the logical principle for charging would be retail-minus on the grounds that intervention to reduce retail prices to close to the level of costs is unnecessary in a market which is intends to be competitive and, moreover, could damage incentives to invest in infrastructure.

The implementation of a retail-minus principle for MVNOs would however be different from its implementation for 2G/3G roaming and for Indirect Access (IA) for mobile networks, because (in the case of 2G/3G roaming) the avoided costs would be different and (in the case of IA) the retail tariff from which avoidable costs are to be deducted would be different from the IA retail tariff starting point.

On the difference between retail-minus for MVNO services and retail-minus for roaming between 2G and 3G networks, MVNO services (minimum use of the mobile operator's facilities), would require much less from the mobile network than the end-to-end call connection required to provide a roaming service to visiting subscribers of other countries' mobile networks. The foreign visitors' calls would be routed end-to-end just like any other calls on the mobile networks from mobile operators' own customers, who have service contracts directly with them or with their service providers. By contrast, the MVNOs' calls would be routed off the mobile network at the earliest economic point to reach the MVNOs' facilities for further conveyance and delivery. In this, the MVNO calls would be much more akin to indirect access calls from mobile networks, using access codes to select IA operators' facilities.



Conversely, on the difference between retail-minus for MVNO services and retail-minus for IA services on mobile networks, the retail tariff starting point for MVNO calls would need to parallel the retail tariff starting point for roaming calls: that is - covering the cost of access to the network as well as the cost of handling the calls. Retail-minus for MVNO calls has thus also to include elements of the retail price for the network subscription, covering the cost of the radio facilities linking the handset to the base station, the equivalent of the local Loop; in the same way as such costs have to be included in the price base for retail-minus when applied to 2G/3G roaming.

3.3.3 Regulatory Positions in other Jurisdictions:

The views of regulators towards MVNOs differ across various jurisdictions, where opinions have been both for and against MVNO regulations. Nevertheless, regulators in many countries are considering to what extent the regulatory intervention, including access price and conditions, is necessary, if indeed there is such development.

Here we document some examples for and against regulatory interventions from various jurisdictions:

Supporters of Regulatory Intervention

Those in favor of regulation argue the following:

- Mobile network operators control the available radio spectrum, which is a bottleneck facility that is an entry barrier for new mobile network operators. Hence, mobile network operators are less likely to provide MVNO access unless it is a regulatory requirement;
- Regulation of the mobile market is said to be failing, which is another reason why MVNO regulation maybe a good idea; and
- Mobile operators have very high profit margins of 25%, in some cases significantly over costs. Current regulation, as interpreted by some national regulatory authorities, already provides the power to enforce an access obligation on existing operators.

Opponents of Regulatory Intervention

Those who are opposed to MVNO regulatory intervention argue on the following basis:

- Benefits of MVNOs are as yet unproven, and that there is inadequate evidence that market failure has occurred;
- The mobile market is competitive by nature and therefore does not require regulation;
- There is no industry consensus that MVNO access is necessary; and
- There is a bleak possibility that MVNOs could even discourage investment in mobile networks (both 2G and 3G). Anti-regulatory intervention stances also argue that regulatory measures such as indirect access or 3G networks will improve the competitive situation.



3.4 Conclusion

Overall, the MVNO market would be a welcome in Botswana since it may be costly for a new entrant to build infrastructure, MVNOs may offer the solution to bring in innovation and affordable services as seen in South Africa.

3.5 Global Mobile Personal Communications by Satellite (GMPCS)

Unlike MVNOs, where several considerations need to be made by the regulator as detailed below, GMPCS are new technologies riding on the new converged ICT technologies and sector. GMPCS is a personal communication system providing transnational, regional or global coverage from a constellation of satellites accessible with small and easily transportable terminals. Whether the GMPCS satellite systems are geostationary or non-geostationary, fixed or mobile, broadband or narrowband, global or regional, they are capable of providing telecommunication services directly to end users. GMPCS services include two-way voice, fax, messaging, data and even broadband multimedia. According to some estimates, GMPCS services could be expected to constitute approximately 2-3% of the cellular market²⁹

GMPCS networks vary in the make-up of their components, and in the type of service provided, but generally shared a number of characteristics, with satellite constellations providing direct links to users, and interconnecting with existing terrestrial networks. The underlined fact remains that GMPCS complement rather than compete with existing networks and thus from a regulatory perspective are easily accommodated within regulatory frameworks which ride on neutral licensing regime.

3.6 Regulating GMPCS

While GMPCS is universally recognized as a basic system for development of telecom infrastructure, it is up to the policy makers to make sure that GMPCS services be available on a non-discriminatory basis, co-exist with PSTN services, be cost-effective and preserve the sovereignty of the country. Regulation thus helps with addressing issues such as security, tariffs, licensing, royalties, etc. While the various GMPCS networks each have specific characteristics, they generally share the following features: space segment (satellite constellation), ground segment (earth stations) and the user segment (terminals).

In order to facilitate the introduction and development of GMPCS, a Memorandum of Understanding (MOU) was negotiated at the World Telecommunication Policy Forum (WTPF) in 1997 and signed by member states and other recognized private operating agencies (RPOAs)³⁰. In the MoU it was agreed that the issuance of a license or other authorization be done by an Administration (ie Member State) and/or Competent Authority (ie ICT Regulatory Agency) in conformity with the national laws and regulations of that country and the ITU Radio Regulations.

²⁹ ITU website – www.itu.int/en/gmpcs

³⁰ *ibid*



GMPCS System Operators and GMPCS Service Providers are subject to the national laws and regulations in each country in which the GMPCS Service Provider operates.

3.6.1 Examples of GMPCS Regulation

Most of the models used for GMPCS are within the Unified licensing framework. Some administrations, such as Sri Lanka and Singapore, have opted for a regulatory framework which does not require service licensing, unless a particular GMPCS system includes the installation of an earth station in the country, in which case a facilities license would be required. Other administrations provide licensing systems on first-come, first served basis, with no limit on the number of operators. In both of these categories, service providers offering GMPCS Service from a GMPCS operator had already been licensed to provide telecom services and were within a unified licensing framework.

In yet some other administrations like Pakistan, GMPCS services remain the domain of a monopoly operator, which is either required to apply for a license from the relevant regulatory authority, or currently authorized to provide GMPCS Service as part of its general operating license. In these latter cases, provision of GMPCS Services from an operator is dependent on conclusion of a commercial arrangement with the incumbent operator. However all administrations required some form of licensing with respect to access to frequencies, following on frequency co-ordination.

A detailed look at Singapore

With the full liberalization of Singapore's telecommunication industry from 1 April 2000, Infocomm Development Authority (IDA)³¹ Singapore's regulator adopted a technology-neutral approach towards licensing of telecommunication service providers. Consistent with this approach, IDA viewed GMPCS services as similar to cellular mobile phone telephone services and international telephone services. IDA did thus not issue separate service provider licenses for GMPCS services. However, GMPCS operators who wish to offer both domestic and trans-border mobile telephone services can either

- (a) work with the relevant licensed Facilities-Based Operators (FBOs) and/or Services-Based Operators (SBOs) in Singapore and offer the services through them or
- (b) apply to IDA to be licensed themselves.

IDA requires its licensees to seek IDA's approval for any joint venture, association, contract or arrangement with GMPCS operators to provide or operate licensed systems or services of the licensees, and to file with IDA details of the services to be introduced. In addition, all GMPCS terminals need to be type approved by IDA before they can be sold for local use. Individuals who purchase GMPCS terminals from overseas for local use need to have their terminals

³¹ www.ida.gov.sg



individually approved by the local service providers. Use of GMPCS terminals in Singapore is subject to the same class licensing scheme as public cellular mobile phones, public mobile data terminals and trunked radios. Personal GMPCS terminals brought in by foreign visitors is treated as mobile phones at the Customs, with no additional restrictions. Currently, Customs allows foreign visitors to bring in personal mobile phones. Equipment dealers importing GMPCS terminals need to seek advance import clearance from IDA through TradeNet, the country's clearing agency.

3.7 Summary:

This chapter has sought to provide the technical economic and regulatory issues for consideration in the introduction of MVNO and GMPCS services in Botswana. Having outlined the issues to be considered and provided opinion based on other jurisdictions, the following key questions are put forth for plenary and stakeholder discussion.

Definition of MVNOs

Behind the concept of MVNO, there is a range of ways in which it can be put into effect depending on the extent of the use of the mobile operators' facilities: It will be important for BOCRA to and the potential MVNO to define what these variations might be and which would be most attractive to operators or customers.

As part of this definition of what the MVNOs may request from networks, it is important for BOCRA together with the MVNO and MNO to define which elements constitute parts of the 'access' service and which are akin to interconnection services; and especially on the classification of the important ancillary services (such as interrogation of data bases for essential verification, location and routing information and for the entering and storing of information on such data bases).

Assessing demand for Mobile Network Codes (MNC)s

The decisions on whether there should or should not be an obligation on mobile network operators to supply services to MVNOs - and on what terms and conditions - will influence the level of interest in MVNOs and hence the demand for MNCs. It is thus important for BOCRA to be clear on the regulatory implication of either choice.

In the absence of commercial agreement, is there a basis for requiring mobile network operators to supply MVNO services?

Best practice is for the parties to come to commercial agreements. However, this may not prove possible.



If there were an obligation, which of the mobile operators should be liable? Under what criteria?

As shown from other jurisdictions, options differ on this issue with minimum regulation, confined as far as possible to those with market power. Stakeholders views on whether any obligation to supply MVNO services should extend to one, two or all of the mobile networks will be required.

In conclusion, the MVNO concept will continue to receive heightened level of interest over the next few years and is expected to provide more competition and innovation to the telecommunications market. It is noted that many of the incumbent operators in many countries have now accepted the existence of MVNOs which to some extent do provide opportunities to the MNOs themselves especially when they stand to benefit from tapping niche markets which they previously could not serve.

However, challenges still remain for new entrants to penetrate the telecommunication market as long as there are continuous changes in the telecommunication landscape. But by capitalizing on market differentiation and segmenting the industry instead of competing on price, some MVNOs have proved to be resilient.

Approaches to regulatory intervention are observed to differ around the world, while most MVNOs thrive in unregulated market conditions where regulators take a monitoring position. There are clear indicators of various business models for MVNOs with differing degrees of relationships with MNOs, different wholesale strategies, and approaches to value proposition for the end-users. Though one model may be deemed successful for one MVNO, it may not work for another MVNO due to unique challenges in context and inherent issues arising in the business models.

The appropriate entry strategy – a strong partnership with an MVNO, a large customer base, the ability to acquire customers at a lower cost than the industry average and an experienced execution team – are the few key basics to a good head start. Overall, the outlook for the expansion of the MVNO and or GMPCS industry in Botswana looks promising with diverse opportunities especially for non-telecommunication providers.



4. ANALYSIS AND RECOMMENDATIONS

In spite of the continued growth in the ICT sector in Botswana, two issues remain a challenge for Botswana's diversification to the knowledge economy:

1. Relatively high level of retail and wholesale prices for broadband internet
2. A limiting regulatory framework

Drawing from the various regulatory issues raised in the previous chapters, this chapter considers the regulatory interventions available to BOCRA. The key question driving this sector is *“what can BOCRA do to speed up the ICT growth and create a knowledge based society?”*

4.1 Regulatory options to manage retail and wholesale prices

Given that price is a key factor of a country's ICT uptake, then it is important to determine the extent to which BOCRA can influence the eventual retail and wholesale prices in the market. Below are a few recommendations drawn from existing regulations at the disposal of BOCRA.

4.1.1 Mobile Termination Rates (MTRs) Reduction

Mobile operators charge other operators for connecting calls to their network. These are known as mobile termination rates (MTRs). Both mobile to mobile (M2M) and fixed to mobile (F2M) calls incur MTRs. The rationale for regulatory intervention in MTR pricing is that call termination is a monopoly: while call origination can be made competitive in numerous ways, there is simply no alternative to terminating a call on the network of the operator which owns the number a caller is trying to reach.

Termination rates above the cost of an efficient operator distort the market and produce anti-competitive effects. Operators are considered to have significant market power (SMP) when providing call termination services on their network. As such, regulators typically require MTRs to be regulated and, generally, cost reflective. While there is no conclusive evidence on the relationship between MTR and retail prices, overwhelming international evidence from across the world show that cost-based MTRs seem to encourage competition and more affordable pricing.

MTR in Europe

The level of MTRs across Europe has been falling at a considerable rate for several years.

This has been driven by two factors.

1. A general downward trend in the underlying unit costs of delivering these services (as a result of both expanded output and technological developments)



- The European Commission's (EC) recommendation in 2009 that MTRs should be on 'pure LRIC' (long run incremental cost) basis (i.e. they should only reflect the long run incremental cost exclusive of any fixed and common costs) and that in exceptional circumstances where a national regulator cannot develop a cost model in time, then it must set interim prices that are consistent with the Recommendation. Whilst the EC envisaged that the recommended move to pure LRIC based MTRs would take several years, MTRs have been falling at a much faster rate since 2009. Based on current trends, MTRs in Europe by late 2014 could be expected to fall approximately 1 Euro cent.

MTR in Botswana

Given that mobile termination is an inherent monopoly more so in African countries where the incumbent operators or first licensed mobile operators tend to dominate the market, regulators have no alternative mechanism besides adjusting termination rates in line with costs – if such adjustments are not made by operators. Determining costs can be done by a regulator through a benchmarking exercise of termination costs, such as was undertaken in Namibia in 2009, or through detailed cost studies such as those undertaken by the ICT regulators in Botswana in 2011, Kenya, Nigeria, Tanzania and Uganda in 2012.

Like other African countries, Botswana committed to a termination rate glide path in 2011. The glide path started at 0.453 Pula in 2011 to 0.295 Pula in 2014. Mobile termination rates are currently set at 0.348 Pula. Table 2 below provides the trend in MTR to 2014.

Table 3: Mobile Termination Rates in Botswana

	2011	2012	2013	2014
Fixed termination rate	0.174	0.183	0.191	0.201
Mobile termination rate	0.453	0.401	0.348	0.295

In Africa, the most aggressive termination rate declines have been in Kenya, Tanzania and Ghana. The reduction in termination rates in Kenya has had a follow-on effect on pricing, with prices rapidly decreasing³². The table below compares MTRs for several African countries. Although a full benchmark study would need to consider the cost factors that might determine or contribute to differences between countries, the figures in table 3 below are indicative of likely space for future movement which could exist in Botswana.

³² See Communications Commission of Kenya Website at www.cck.go.ke



Table 4: Mobile Termination Rates in selected countries in Africa

Country	Mobile Termination				
	Regulation	Currency	US \$ FX*	US cents	USD
Kenya	1.44	KES	0.01151	1.66	0.0165744
Tanzania	34.92	Shilling	0.0006	2.1	0.020952
Ghana	0.045	New Cedi	0.51259	2.31	0.02306655
Nigeria	4.9	NGA	0.00624	3.06	0.030576
Namibia	0.3	NAD	0.10625	3.19	0.031875
Botswana	0.35	Pula	0.11921	4.17	0.0417235
South Africa	0.4	ZAR	0.10726	4.29	0.042904
Cameroon	25.00	XAF	0.00197	4.93	0.04925
Mozambique	2.5	MZN	0.03295	8.24	0.082375

Kenya is recognized as being a leader in reducing termination rates towards cost. Research has confirmed the view that termination rates that are close to cost have benefits to consumers, with increased competition amongst operators. From the table above, the average termination rate for the sampled country is USD 0.038 compared to Botswana's rate of USD 0.0417. Botswana's termination regime is more expensive, on average, than other countries and 151% more expensive than Kenya, i.e., 2.5 times the price of Kenya.

The impact in Botswana is that termination rates have a harmful affect on smaller operators because the majority of calls from a smaller operator are likely to terminate on the larger networks. BeMobile, as the smallest operator in Botswana, would have approximately 87% of its calls terminate on either Orange or Mascom's network³³. Furthermore, dominant operators tend to use on-net / off-net prices to discourage customer churn.

However, because of its small market share, the options for beMobile to do the same profitably are limited. This problem is further exacerbated when it is considered that beMobile is the currently the newest entrant to the market under the BTC subsidiary. Given BTC recent privatization process, BTC will be relying on beMobile for growth in the sector. It is envisaged that lower termination rates would therefore encourage the growth of the sector and particular serve to encourage competition in retail prices that could be gained from the lowering of the MTRs.

³³ Source Intel Research and Consultancy 2013



The African benchmarks in the OECD price basket³⁴ for 2013 to quarter 1 2014 reflect that pricing is high in Botswana compared to other African countries. This is also true for fixed line services. Given that a large portion of the population use internet on their mobile phones then this has an overall impact on the ability of the diversification of the economy to a knowledge economy.

Recommendations:

- Short term - Conduct a review of the existing MTR regulation in the Botswana
- Mid/Long-term - This study has not sought to provide a pricing study of the market in relation to purchasing power parity and as well in comparison to different price baskets of other commodities in the sector. It is recommended that such a study be undertaken as it would provide guidance on the costing models both in the sector inclusive of that of broadband.

4.1.2 Wholesale prices and the creation of BOFINET

In seeking to expand the role of ICT in the country, the Government of Botswana through policies such as the National ICT Policy (Maitlamo), Competition Policy, Privatization Policy and other national policies envisaged a country where broadband was accessible based on affordable prices and easy access. While there has been huge Government initiative in this process, with its decision to invest in undersea cables, and as well the investment on infrastructure by the existing mobile operators, one key regulatory issue continues to put a stranglehold on the use of broadband in Botswana. Namely, international access to bandwidth remains expensive as noted by the stakeholders, which in turn influences pricing costs within Botswana borders. Yet in spite of this known fact, stakeholders bemoan the long duration given to the former BTC now BOFINET as a key holder of infrastructure to make it more open and transparent in its dealings both on price and open access.

The current wholesale price for national bandwidth is based on:

- An access charge, paid directly by the customer to BTC, covering the network between the customer premises and the point of reference of the ISP,
- A bandwidth charge, paid by the ISP to BTC.

This in turn is also based on the international bandwidth costs that BTC claims to incur. Given the ongoing privatization process and as well the recent split of BTC infrastructure to BOFINET. Under the new structure, BOFINET owns the country's nationwide backbone infrastructure, which includes the Trans-Kalahari fibre-optic network and the Gaborone-Francistown loop, as well as managing the government's participation in the Eastern Africa Submarine System (EASSy) and the

³⁴ For detail on the shows the current tariff comparison across selected countries in Africa see http://www.researchictafrica.net/prices/Fair_Mobile_PrePaid.php



West Africa Cable System (WACS). BoFINET intends to serve telecoms companies such as BTC, Mascom Wireless and Orange as well as Value Added Network Operators (VANS).

The creation of BOFINET does not seem to provide any change on the issue of dominance in the market. BOFINET will therefore have to ensure that their tariffs are cost oriented. The fact that BOFINET holds the governments interest in WACS and EASY therefore requires more concerted effort in ensuring that lower prices are negotiated. BOCRA as the regulator will need to play an active role in this regard.

Three main avenues are open to BOCRA. Firstly, BOCRA must engage more actively in the pricing structure of BOFINET. Participation in regional regulatory meeting such as those in SADC allow it on behalf of Government to request for a more open system in the pricing structure of bandwidth

Secondly, because, fiber optic access network can be considered as a natural monopoly then it is important that open access principles are enforced by the regulator to any of the operators. Consumers must therefore be free to choose any service under an open access network. In addition, as BOFINET may be carrying a monopoly of service then it is paramount that all authorized players in the market be free to deliver services on the principle of open access.

4.1.3 The case of BPC as an infrastructure owner

Botswana Power Cooperation (BPC) owns 850 km of fibre optic cable which covers most of the major urban areas and large villages on the eastern side of the country. Discussions with BPC revealed that they were an interested party in participating in the new offering that their infrastructure promises in providing services to the market.

While setting up an entity that would use the excess fibre optic cable to provides communications services would be a good option, it presents difficulties for both the Government and other stakeholders in the market. For the Government, the creation of BOFINET already hints an already fully government owned entity for the medium term. In seeking to create some competition, it seems logical for BOCRA to allow BPC to lease dark fibre to BOFINET, BTC, Mascom and Orange under a simple authorization regime existing within a Unified Licensing Framework.

4.2 Creation of a Unified Licensing Regime

The merits of a unified licensing framework cannot be underscored. Chapter two of this document gave detailed analysis of the proposed opportunities that the unified licensing framework offers. Chapters 3 further showed that any introduction of new technologies would be catered for within this framework. This section summarizes the key aspects of the Unified Licensing Framework as recommendation to BOCRA

4.2.1 Neutrality, Simplification and Flexibility

Neutrality – The current framework used by BOCRA is still heavily horizontal rather than vertical centered still within service and technology. As has been explained, neutral authorizations do not



designate a single, specific service that the licensee can offer under the authorization, nor do they prescribe the technological infrastructure that must be used to deliver the service. Licensees are not restricted by narrow, service-specific and technology-specific authorizations. Instead, these authorizations permit the licensee to offer any of a range of services, using any technological infrastructure that is capable of delivering the desired services. In addition, neutrality in licensing is complemented by simplification of the authorization regime.

Simplification – Simplification involves the consolidation of different types of service-specific authorizations into a broad, generic category of authorization or even the unification of all authorizations into a single, unified authorization. Simplification reduces the complexities that flow from service-specific authorization frameworks by consolidating the many authorizations that service providers are required to hold into a few or even one single authorization. Given the additional shift to a broadband environment in Botswana, then neutrality and simplification in the unified framework gives service providers the ability to respond to market demand for services using the most efficient technology and infrastructure available. In addition, neutrality and simplification also ensure that service providers are treated equally and are not subject to any competitive disadvantages by virtue of the service provided or technology used to deliver the service. The existing framework has some biases where this is concerned.

Flexibility – Many regulators have responded to the dynamism in the ICT sector by adding greater flexibility to the authorization regime. Regulators from Costa Rica, Jordan, Pakistan, Thailand, and Tunisia have all noted that flexibility in licensing, for example, enabling service providers to offer multiple services, is an important step in attracting investment in NGN. A number of regulators have taken measures to add some flexibility to the authorization regime for spectrum usage. For example, some regulators have allowed licensees to refarm allocated spectrum: that is, regulators have allowed licensees to use spectrum initially allocated for 2G services to be used to provide 3G services. In Hong Kong China, mobile service providers have been given the right to choose to use 2G or 3G technology in the spectrum assigned to them in their 2G authorizations. France and Switzerland have also begun to allow operators to refarm spectrum in the 900 MHz range. Regulators have also allowed greater flexibility for spectrum licensees to resell all or some of their allocated spectrum on commercially negotiated terms. Countries that now permit such spectrum trading include: Australia, Canada, Guatemala, New Zealand, Norway, the USA, and the UK. Austria, France, Germany, the Netherlands, and Sweden have permitted spectrum trading on a more restricted basis³⁵.

4.2.2 Participating in the demand side of the ICT ecosystem

The Unified Licensing Regime creates an opportunity for BOCRA and the Government to become more involved in a structured way in the wider ICT sector ecosystem. The introduction of an applications and content license category within the unified licensing framework connotes the

³⁵ITU/infoDev/World Bank (online) ICT Regulation Toolkit – www.ictregulationtoolkit.org



important notion that content is a key development of broadband and the uptake of the knowledge economy envisaged in the diversification program of Botswana.

But, content provision will only exist as market players (all stakeholder in society) interact with each other. The demand for content will therefore require an active participation from BOCRA in ensuring that it spurs an environment of content creation. Several avenues exist, details of which can be found within the reports provided under the various components of the Botswana Economic Diversification and Competitiveness Project undertaken by the World Bank. Nonetheless, a few important areas that require BOCRA's active role are mentioned below:

- a) The creation of content and applications development hubs in all sectors but more importantly in education, health and agriculture. This will require innovative incentive driven by Government and coordinated by BOCRA to ensure that while infrastructure is deployed, there is localized applications and content available for use.
- b) The development of e-commerce and m-commerce. This will not only mean an active role for BOCRA in participating in the review of the sector policy by the Ministry but as well a review of all regulations that touch on these areas
- c) Mobile Banking -- The wider ecosystem, requires BOCRA to create new forged relationships with other regulators. These newly created co-regulatory environments require the development of regulations that are not centered within the ambit of BOCRA but that are a one stop shop were regulation is concerned.
- d) E-Government – e-government and other online services require BOCRA's active role in participating in the creation of legislation that accommodates written and online transactions or exchanges, privacy rules among others.
- e) Consumer Protection – more importantly under the new converged ICT sector environment, consumer protection take on new meaning with the addition of broadcast and online content.

4.2.3 Implications for BOCRA's institutional structures to fit the new regulatory regime

As a result of convergence, Governments have identified various reasons for moving to a single regulator with responsibility over various industry sectors. By shifting regulatory responsibilities regarding the communications sector into one government agency, stakeholders have a one-stop-shop for resolving regulatory issues, resulting in greater consistency in regulatory approach and practice. In addition, certain operational efficiencies should result in greater resources should be available, since the single regulator now has a larger pool of experts. Furthermore, less overlap and turf battles between government agencies would be the natural result of a single regulator. Operators find it easier to have to comply with only one regulatory authority and to address their issues in one place. Another benefit of having a converged regulator is that it better reflects the marketplace, given that operators now offer triple and quadruple play offerings. This



shift has been made with BOCRA with the introduction of the Communications Regulatory Authority Act 2012 (No. 19 of 2012), which replaced the Telecommunications Act of 1996 (No. 15 of 1996) allowing former BTA to be responsible for day-to-day operations and the licensing of telecoms operators until its merger with the National Broadcasting Board (NBB) on 1 April 2013, pursuant to the Communications Regulatory Authority Act 2012 and thus creating BOCRA.

However, it is noted that line ministries are yet to align themselves to the new CRA (2012). While it is in the purvey of every government to decide what is best this should be based on the objectives that they are trying to achieve and then think about what functions are best placed under a converged ministry. For example, in certain countries, such as Venezuela, the regulator has responsibility over broadcasting and telecommunications but may not have authority over consumer protection and competition issues, which are the responsibility of other authorities. Similarly, in Canada, spectrum matters are addressed by Industry Canada rather than by the regulator, the Canadian Radio-television and Telecommunications Commission (CRTC). In other instances, responsibility over broadcasting content may reside with a separate regulatory authority. In Singapore, the Infocomm Development Authority (IDA) has responsibility over telecommunication and information technology matters, but the Media Development Authority (MDA) licences over-the-air television and regulates content.

Competition laws

In addition, BOCRA and the Government of Botswana will also need to consider the relationship between telecommunication, broadcasting, and competition laws. Should the regulator have any responsibility over competition issues? Different countries take different approaches. In Australia, for example, the communications regulator has no authority over competition issues whereas in the United Kingdom, Ofcom has jurisdiction concurrently with the Office of Fair Trading. The issue of whether a sector regulator will generally be subordinate to a general competition authority with regard to telecommunication and broadcasting issues that include a competition element is important. For example, in Singapore the IDA only has authority only to the extent that such responsibility has not been granted to the Competition Commission. If the jurisdiction and responsibilities of these two authorities are not appropriately balanced, inefficiencies and jurisdictional debates may ensue.

BOCRA and other agencies in the roll out of ICT

BOCRA and the Government will need to access its internal fit to the wider converged ICT sector. As alluded to within this chapter, BOCRA now enters a new ecosystem requiring a different orientation to other institutions previously seen as aloof. The policy objectives for a converged ICT sector include ensuring that all diverse policies aligned to ICT in other sectors are streamlined. And may require persons assigned within the regulator to keep abreast of the different emerging sectors within the new ecosystem.



More Transparency

The shift to a wider ecosystem requires a more service oriented BOCRA. This will require a shift from horizontal departments within its internal structure to one that cuts across core service issues. Many regulators had, under the old frameworks departmentalized themselves based on the infrastructure being provided within the telecoms sector.

In addition, there will be need for BOCRA to reassess its capacity to be able to deal with the new regulatory areas that the new ecosystem creates. While it is always good to have external consultants participate in providing an honest feedback of the sector, consistent research on market dynamics such as price, use of infrastructure, content development and wider aspects of broadband such as services created require a regulator that is fully armed with a research department capable of addressing the day to day needs that emerge in the sector.

Further, because uncertainty as perceived by the operators exists on the relationship of BOCRA with the newly created BOFINET, there remains a vacuum on whether the regulators intention in ensuring that its core mandate of ensuring competition in the sector is achieved with this new player in the market. Stakeholders further note that historical experience has shown a tendency for BOCRA to bias Government entities rather than fairly regulate the government as one of its stakeholders in the sector. BOCRA will need to have an open transparency in its dealings and agreements with BOFINET that remove speculation of perceived lack of regulatory oversight.

Finally, regulation should be guided by a clear and predictable framework that meets a range of public interest objectives whilst recognising the need to promote investment particularly in new services. As a result, it must encourage full participation by citizens in the information society. Effective regulation that supports sustainable investment requires some independence from political influences, especially on a day-to-day or decision-by-decision basis. Indeed, it is noted that absolute independence of regulatory bodies is neither possible nor desirable. A regulator should not set and implement its own agenda. “Independent” regulators are expected to be subject to government oversight and a system of checks and balances. However, a regulatory body must be an impartial, transparent, objective and non-partisan enforcer of government-determined policies by means set out in controlling statutes of the regulator, free of transitory political influences and as well independent from the industry that supplies ICT services.

4.3 Conclusion

As has been shown through this report, there is a lot expected of BOCRA as the regulator of the converged ICT sector and the wider ecosystem attached to it. No doubt BOCRA is ready for this



new challenge and is encouraged to stay within the core principles of transparency, accountability and predictability as it carves out a regulatory environment that supports the sustainable growth of ICT in Botswana.

The size and untapped nature of the communications markets in Botswana, owing in part to the convergence of the ICT sector, continue to be a source of investor interest. The relatively high levels of investment made by the current licensed operators, as well as by the government, are evidence of this. However, there is a risk of investment by exclusively one group (mobile operators) with little investment in other critical areas of the information infrastructure required to run a modern economy effectively. It is noted that the Government of Botswana has taken huge steps by investing in EASSy and WACS to ensure that they are doing their part in ensuring that the wider goals of the ICT adoption and use are realized in Botswana. But this investment in the long-distance and international network has not yet been properly matched by investment in the local and feeder networks. Hence, the full benefits of the additional capacity are yet to be seen in the local broadband market.

BOCRA will need to focus on the inter-relationships between multiple operators, and this now requires a sophisticated understanding of market segments rather than a single telecom market, as in the past. While emerging market segments and new entrants in old markets need to be enabled, extension of backbone infrastructure growth in the face of dwindling fixed telephony subscribers that used to drive network extensions needs to be introduced in order to deliver the enhanced services required in an increasingly global economy and society. BOCRA's role in ensuring that the newly created BOFINET and existing market players deliver on affordability and infrastructure investment to the last mile will therefore be crucial.

The objective of affordable access and usage is best achieved through competition, which, in turn, is premised upon market entry, primarily through new and more cost-efficient technologies. Underlying all these technical requirements to regulate this dynamic and fast changing sector are the institutional arrangements and procedures that provide the necessary certainty and stability required for sector development. Investing in these skills in an environment where interests are not separated out and roles and responsibilities not clarified, creates the conditions for powerful interests to ensure their preferred outcomes. Such arbitrary actions will undermine the finest licensing framework, interconnection or pricing regulations. As this report has shown, policy outcomes can be explained and remedied by examining the interplay between the arising institutional arrangement and market structure. These will determine the competitive behavior of players and the ability of the regulator to regulate effectively and neutrally in the public interest.



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