

Regulatory Independence and Wireless Market Development: A Comparative Analysis of Two African Nations

Annemijn F. van Gorp & Carleen F. Maitland

Abstract— This study analyzes the nature of regulatory independence and its influence on wireless market development in Tanzania and Botswana. The study finds that the level of regulatory independence is associated with improved market conditions. The research has implications for theories of regulation and market development in low income countries. In particular the Tanzania case suggests that the independence of regulation can have secondary effects such as diversity of technologies and faster transitions to advanced technologies, while the reversal of independence in Botswana highlights the need for greater insights into the under-theorized *dynamic* nature of regulatory independence.

Index Terms— regulatory independence, Botswana, Tanzania, mobile market development

I. INTRODUCTION

Telecommunications infrastructure has long been seen as a catalyst for economic development [1, 2]. However, its growth is sometimes hindered by a variety of factors including its past as a publicly provided good, regulation, and characteristics inherent to network technologies. As network technologies, telecommunication systems require investments that are susceptible to expropriation and hostage-taking [3, 4], as exemplified in many cases by the government's power to specify a variety of conditions including geographic market definition, coverage obligations, universal service obligations and even prices. Consequently, the level of investment in, and hence the widespread availability of telecommunications services, including fixed, mobile and Internet access is likely to be influenced by regulatory quality that reduces uncertainty and insulates the sector from politically driven actions.

During the past two decades many countries, high and low income alike, have sought to improve their regulatory quality by establishing autonomous national regulatory authorities (NRAs). The level of independence of these authorities from

ministries and other government departments is a key feature of that regulatory quality [5]. Further, empirical studies have found that independence has significant effects on both market and regulatory performance [e.g. 4, 5]. However, many of these studies are carried out either exclusively in relatively high income countries or in global studies covering a broad range of institutional environments. Consequently, they often contain two implicit assumptions that may not apply in low income countries, which in turn raise interesting questions.

The first assumption is that ministries and other government departments are able to wield power, from which independent NRAs are insulated. However, in some low income countries ministries and other government departments are not well-functioning entities and are unable to wield power. In these environments, is regulatory independence still important and if so how?

The second assumption is that gains in independence are sustained. In low income countries where power shifts and political upheavals create generally less stable political environments, assumptions about the linear nature of progress on independence may not apply [6]. Under what conditions are reversals most likely? What are the implications for market development?

Further, whereas earlier research on regulatory quality and market development focused primarily on fixed telecommunications infrastructure, more recent research that includes mobile market development suggests that it is less sensitive to regulatory quality [7, 8]. These findings suggest that in low income countries, where mobile markets often play a more significant role in terms of providing access, regulatory quality may play a much less significant role. Hence, in these markets does regulatory independence influence mobile and wireless market development, and if so, how? Also, is the nature of this influence similar to that found in fixed networks?

In answering these questions this research provides further nuance to theories of regulation and market development. In particular, it sheds light on the relationship between regulatory independence and its stability and wireless market development in low income countries. The analysis employs a comparative case approach of national regulatory authorities (NRAs) of two African countries, namely Tanzania and Botswana. While being among the poorest in the world, these nations are recognized as having two of the better regulatory environments in the region [9]. Data were

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A. F. van Gorp is with the Ted Rogers School of Information Technology Management at Ryerson University, 350 Victoria Street, Toronto, ON M4V1N1 Canada (phone: +1-416-979-5000 ext. 2482; e-mail: avangorp@ryerson.ca).

C.F. Maitland is with the College of Information Sciences & Technology at the Pennsylvania State University, PA 16802 USA (email: cmaitland@ist.psu.edu).

collected through in-depth interviews and document analysis. Comparative case analyses generate insights into the nature of independence and stability as well as their implications for particular characteristics of the wireless market development.

The paper is structured as follows. Section 2 provides background on regulatory independence and its effects. Section 3 describes our research method and data collection techniques and is followed by Section 4 in which the two country cases are presented. Section 5 provides a brief cross-case analysis and in section 6 discussion and conclusions are presented.

II. REGULATORY INDEPENDENCE AND ITS EFFECTS

While research has found that regulatory independence has significant effects on telecommunications market development, to date it is unclear the extent to which these findings apply in lower income countries. In particular, given the differences in the state of institutional development in some lower income countries and the potential challenges of maintaining institutional gains, it is unclear how independence will influence market development if at all. These questions of influence are particularly salient for the wireless market both because it has experienced such rapid growth in low income countries and because evidence suggests the influence of regulatory quality is lower in this sector. These issues are discussed in turn below.

A. Regulatory Quality

For years scholars have argued for the necessity of regulatory independence both for proper functioning of the regulator and to enhance both regulatory and market performance [6, 10]. Regulatory performance is the extent to which regulations fulfill their immediate objective, such as lowering interconnection prices, collecting universal service revenues or lowering entry barrier for new entrants. These outcomes are expected to create conditions which in turn improve overall sector performance by, for example, lowering consumer prices, extending networks, and improving service quality.

Regulatory independence has been characterized by institutional arrangements that foster clarity of roles of the regulator, and accountability and transparency in the process of regulatory decisions [6, 10]. The delegation of authority and need for independence is driven in part by the desire to establish credibility but also in some cases to insulate the regulatory policies from future politically-driven changes (Gilardi 2007). Further, independence is frequently established at the time the autonomous regulator is developed, a frequent driver of which is privatization and liberalization of monopoly public telecommunications operators (PTOs). To this extent, in a study of PTO ownership in Europe, Bauer [11] found that levels of independence were highest for those nations that were slow to privatize their PTO. Thus, he concludes the level of independence may be driven in part by the level of state ownership in the PTO.

Independence is a multidimensional construct, with both formal and informal components, each with several dimensions. While it is often conceptualized as one

component of general regulatory quality (as will be discussed further in the following section), research has suggested it has a unique contribution to market development [4, 5], although findings are mixed [e.g. 11]. Studies of the relationship between independence and market development have employed both qualitative and quantitative methods, with the latter becoming increasingly prevalent along with data availability and relying predominantly on econometric analyses of the formal components of independence.

Measures of formal independence vary in their complexity, ranging from simple dummy variables to highly complex measures [e.g. 4, 5, 11]. The most recent and extensive of these is the EURI-I index, which is based on eleven general measures¹ of formal regulatory independence including: 1. multi-sector, 2. multi-member, 3. funding, 4. reporting, 5. shared roles, 6. legislative appointment, 7. fixed terms, 8. renewable terms, 9. staff, 10. budget, and 11. experience [5]. While many of these variables are self-explanatory, several deserve further discussion.

The multi-sector measure is based on the presumption that a multi-sector regulator will achieve a higher level of independence from any one ministry, with similar reasoning for multi-member regulators (1) versus single member (0). Reporting indicates whether regulators are required to report only to the Minister (0), to both the Minister and the legislature (.5) or only the legislature (1). The shared roles measure indicates whether or not a regulator shares its duties with the government (0) or is granted exclusive powers (1). Finally, experience is measured as whether or not the NRA has been in existence for at least two years.

While the EURI-I index provides a complex measure of independence it is developed only for the European context. Hence, it is unclear the extent to which their results that regulatory independence reduces interconnection rates only when the public telecommunications operator is partially owned by the state, are generalizable to lower income contexts. In addition, a question remains to what extent this operationalization of regulatory independence relates to regulatory issues other than interconnection.

That effects of regulatory quality might be different in lower income countries are suggested by the research of Gutierrez [4] and Wallsten [12]. Gutierrez [4] found that when separating low versus high income Latin American countries the influence of regulatory quality on market development is indeed different. In particular, regulatory quality has less of an impact on market development in the low income countries. The author proposes this may be result of the greater difficulty in implementing a positive regulatory environment in low income countries or that their institutional changes were more recent and therefore have yet to produce changes in the market. Conversely, the variables of competition and privatization have a greater effect in lower income countries, which may be attributed to the greater room for improvement. Similarly, in a study of the impact of

¹ Here we exclude the study-specific measure of interconnect powers, which measures the extent to which the regulator has powers over interconnection. This measure is useful to studies of interconnection but may not be appropriate for studies of other regulatory issues.

an independent regulator on market performance in Africa and Latin America, Wallsten [12] found the regulatory variable on its own is insignificant in explaining teledensity.

Hence, while research concerned with the implications of regulatory quality is becoming more nuanced, with independence, competition, and privatization having distinct contributions to market development, it is unclear the extent to which the direction of these developments are relevant for studying independence in low income countries. The following section discusses the broader context of independence and its implications for regulatory independence in low income contexts.

B. The Context of Independence

While at some level challenges to independence are universal, in different contexts they are likely to vary in their degree. For instance, while nearly all government departments face resource constraints, in low income countries the lack of resources of the regulator and society in general raise special issues for independence. Examples include the inability to pay competitive wages to regulatory staff, resulting in high levels of employee turnover as well as the general scarcity of qualified personnel resulting in the necessity of hiring staff with potential conflicts of interest (e.g. are former Ministry or PTO employees). This occurred, for example, in Sri Lanka where the former Managing Director of Sri Lanka Telecom (SLT) was named Director General of the regulatory authority [13, 14].

This lack of resources may not only affect the regulator itself, but also government departments that serve as partners and possibly opponents of the regulator as well. For example, also in Sri Lanka, Balasooriya et al. [13] found that the Fair Trading Commission, which by law was to serve as the competition authority for the country, was “almost inoperative despite its investigative and quasi-judicial power assigned by its Act” (p. 388).

Such circumstances suggest that measures of a regulator’s independence that focus solely on the regulator may not suffice. Earlier studies on the effects of governance or regulatory quality on telecommunications market development focused on the broader governmental environment. For example, studies examined the effect of the credibility of the policy regime [15, 16] through use of the POLCON index [15], a measure of veto points within a government that in turn constrain any one political actor from changing government policy. The studies found that over a wide range of high and low income countries those with lower likelihood of arbitrary policy changes had higher growth in fixed teledensity.

Examining the relationship between general regulatory quality exclusively in the telecommunications realm is the work of Gutierrez and Berg [17] and Gutierrez [4]. In these two studies, the measure of regulatory quality is developed from a dichotomous measure of the presence (1) or absence (0) of a regulatory framework, to one in which regulatory development is measured as an index. The index includes (1) the separation of operations and regulatory activities, although not necessarily the existence of a separate

regulator, (2) the degree of freedom from political and industry interference, clarity of regulatory functions, accountability and transparency, and (3) the legal basis of the creation of the regulatory body.

These studies suggest that independence will be influenced by a variety of contextual factors. In particular, factors that influence the ability of governmental departments to fulfill their role in terms of providing checks and balances will impact independence, positively or negatively. For example, as described by Jain [18] and Samarajiva [19] in India and Sri Lanka respectively, the judiciary played an important role in mediating the relationship between the PTO, ministry and regulator. Whereas in the Indian case the judiciary challenged the position of the regulator, in Sri Lanka it was supported. Further, in both cases the judiciary fulfilled its role in providing checks and balances. However, does this imply that in other environments where ministries, judiciaries and other administrative bodies are unable to wield power, that independence is still important?

C. Changes in Regulatory Independence

A second assumption implicit in much of the research on the effect of regulatory quality and independence on market development is that gains in quality and independence are maintained. As noted by Stern [6, p. 69], “Even when formally independent regulatory agencies have been set up, as in Argentina or Hungary, the question remains as to how far their independence is (a) genuine and (b) sustainable.” Despite the possibility of reversal little attention has been paid to its implications.

This is not to say, however, that the dynamic nature of regulation is not considered. Indeed, several econometric studies use time series data that capture changes in regulatory quality and independence over time. For example, in the EURI-I index, which measures independence in the 15 original EU member states between 1998 and 2003, regulatory institutions declined in two countries, remained constant in four countries, and improved in nine countries [5]. However, because declines are far fewer than improvements their implications are not obvious from the broader analysis.

It is also important to note that even where the changes in regulatory quality and independence are positive, the effects may not be. Gutierrez [4], in a study of 22 Latin American countries during the 1980-1997 period, examines changes in regulatory quality and suggests that effects on market development may be nonlinear. In particular, he proposes that at low levels of regulation, further enhancement of the regulatory framework at first increases telecom market performance but then over time its impact is slowly diminished.

The possibility of nonlinear effects of institutional improvements begs the question as to how declines in institutional quality affect market performance. However, prior to understanding the effects of declines, more information is required about their fundamental nature (i.e. in what areas of regulatory quality are declines most common) and in what conditions are they most likely to occur.

D. Regulatory Quality and Wireless Market Development

The dynamic nature of regulatory independence raises a second issue which is its differential impact on wireless market development. In particular, Andonova [8] finds that whereas an increase in the institutional quality positively affects the number of Internet hosts, there is no effect for cellular penetration. Further, the static effects of regulatory quality were less for cellular penetration than for fixed line services.

Andonova [8] proposes these findings are due to wireless infrastructure being less of a sunk investment, one that can be redeployed and thus less prone to expropriation and hostage taking. While this may be true in theory, the rapid pace of technological change may hinder the redeployment of wireless infrastructure. Other reasons for the lack of influence of regulatory quality on wireless services are possibly the lower level of regulation, greater prevalence of private ownership and the high level of demand.

These factors suggest that a closer examination of the relationship between wireless market development and regulatory quality is required. Earlier studies of regulatory quality [e.g. 12, 17, 20] actually used wireless market development as a predictor of fixed line market growth. Clearly greater understanding of the influence of regulatory quality on wireless market growth (both fixed and mobile/cellular) is required. Also, whereas studies have focused primarily on market growth in terms of access and/or users as well as efficiency of the sector, the relationship between regulation and the wireless market given the less central role of regulation may require a more nuanced understanding. Further, given the rapid growth of wireless markets worldwide, it may be time to look at higher level service criteria than merely access.

Thus, this research seeks to provide further nuance to theories of the role of independence in telecommunications market development. Research on regulatory independence in the 80's and 90's was primarily normative, given the limited experience of regulators. Next, qualitative case study research began to emerge and provide insights into independence as a contribution to regulatory quality. As experience with independence grew and data became available econometric studies began to provide systematic evidence of its effects. Here, we seek to contribute to research based on in-depth case studies that can subsequently inform more systematic analyses. In particular, we seek to provide insights into the nature of independence, how and why it changes and how it affects wireless market development in low income countries. These insights may subsequently generate greater nuance in both qualitative and econometric studies.

III. METHODS

The study takes a comparative, explanatory case study approach [21]. Tanzania and Botswana have been selected as cases for their similarities as well as differences. They are both members of the Southern African Development Community, which generates a common approach to

regulatory governance, albeit a general one. Further, both countries have in recent years experienced relatively strong telecommunications regulatory governance, with Botswana being recognized by the ITU [22] and Tanzania by the 2006 ICT Investment Summit [9]. Furthermore, both countries have recently implemented a converged licensing framework as two of the first countries in the continent. The implementation of such licensing frameworks has the potential to significantly affect wireless market development, as indeed has been the case in Tanzania [23].

In addition to these similarities there are differences as well. First, the two countries come to the strong regulatory positions via different routes, with Botswana having a past characterized by political stability and strong governance throughout the government, as compared to Tanzania that has had a history of political and economic turmoil. Second, most recently while Tanzania's regulator has maintained its independence, Botswana has decreased [9]. This difference enables a comparative analysis of regulatory quality as well as its link with wireless market development. These dynamics in regulatory governance in both countries, historically and most recently, facilitate comparisons that can identify their underlying factors.

Data were collected through 46 face to face interviews conducted in Tanzania and Botswana during September –November 2006, with managers at incumbent and mobile operators and Internet Service Providers (ISPs), as well as with policy makers from ministries responsible for telecommunications and regulators from the national regulatory authorities. Additional data were collected through policy and document analysis from 2006 until present.

Data were analyzed through a combined deductive and inductive analysis. The goal of the deductive analysis was to characterize the degree of independence according to the EURI-I index as developed by Edwards and Waverman [5] and changes in policies and market development, while the inductive analysis was used to identify possible underlying factors influencing these phenomena, with a particular focus on the dynamics of regulatory independence (i.e. sustainability of gains in independence), and the role of, and relation between, Minister, judiciary, and other administrative bodies with the regulatory authorities.

IV. REGULATORY INDEPENDENCE AND WIRELESS MARKET DEVELOPMENT IN TANZANIA AND BOTSWANA

In the following sections the development of regulatory bodies and markets for wireless services are discussed. Both cases start with an overview of regulatory and wireless market developments as related to the implementation of converged licensing frameworks, followed by a more detailed analysis of these countries' evolving regulatory independence.

A. Tanzania Case

Regulation and Market Development in Tanzania²

In 1993 Tanzania liberalized its telecommunications sector by splitting its state owned enterprise, the Tanzania Posts and Telecommunications Corporation, into three separate entities, namely the Tanzania Posts Corporation, the Tanzania Telecommunications Company Limited (TTCL), and the Tanzania Communication Commission (TCC). The latter became responsible for regulating the telecommunications market, whereas Tanzania's ministry responsible for communications - currently known as the Ministry of Infrastructure Development - was responsible for developing higher level policies. Established in 1993, TCC was among the first 30 autonomous regulatory authorities in the world [5, 23].

Nearly simultaneous to this early liberalization process, in 1993 three mobile operators were licensed [24], with two more were added in 2000. These later entrants, Vodacom Tanzania and Celtel, are now market leaders in voice services provision³. The addition of these two new providers spurred growth: While until 2000 subscriber numbers for mobile telephony remained low, since 2000 the number of telephony users has grown exponentially⁴. Nevertheless, adoption numbers still remained low as compared to many other countries. Hence, steps to further liberalize the sector and increase competition were taken.

One of the first steps towards full liberalization of the market was the partial privatization of incumbent fixed line provider TTCL in February, 2001. Two companies, one of which was the mobile operator Celtel International, obtained 35% of the shares, the Government of Tanzania kept 36%⁵, and the remaining 29% went to local and international financial institutions as well as TTCL employees. At the time of the privatization, TTCL was granted a four year exclusivity period for fixed line telephony provision, until 2005.

Next, as part of Tanzania's liberalization strategy, regulator TCC merged with the broadcasting and postal regulators into TCRA, the Tanzania Communication Regulatory Authority, established through the new telecommunications Act in 2003.

After TTCL's exclusivity period ended, in early 2005, TCRA introduced a range of new regulations to further stimulate competition; the most famous one being the introduction of a converged (technology and service neutral) licensing framework. This meant that all operators as of then were eligible to provide both fixed and mobile services: firms

once relegated to particular service categories (e.g. fixed, mobile, value added, etc.) could obtain licenses without restriction to the types of services offered. Consequently, all of Tanzania's large operators now have a network facility license, network service license, and application service license, which in some instances are complemented by a content services license, alongside frequency spectrum licenses for wireless services provision.

The new licensing framework resulted in market entry and an expansion of the range of (wireless) technologies [23]. By May 2006 four new service providers had frequency assigned, and started rolling out mobile services including 3G through CDMA2000 [23]. In addition, one recent (2000) entrant from the Internet access market has expanded its services to broadband and voice services provision, bringing the total number of mobile providers in Tanzania from 5 to 10 [23]. Further, the number of internet service providers rose from 11 to 23⁶. New technologies are reflected in the use of CDMA (due to scarcity of GSM frequency bands), as well as upgrades of mobile networks to third generation technologies (both UMTS and CDMA). Also, most operators indicate an interest in the potential for WiMax rollout, which is globally still in its infancy⁷.

Regulatory Independence in Tanzania: The Roles of the NRA and Minister

The growth of Tanzania's market has been significantly influenced by regulation, the most recent one being the introduction of a converged licensing framework. As already reported by Van Gorp and Maitland [23], Tanzania's regulatory authority TCRA is characterized by a number of factors that have enabled it to introduce such competition stimulating regulations. Its regulatory independence is one of the key features, as will be discussed in more detail next.

The independence of TCRA can be analyzed first by the EURI-I indicators suggested by Edwards & Waverman [5]. Among these factors, those that suggest the TCRA is independent include (1) multi-sector jurisdiction (telecom, postal and broadcasting); (2) multi-member board control; (2) fixed term appointments of board members; (3) appointments of board members are renewable only once; and (4) experience – with 13 years TCRA is one of the older regulatory agencies in the world. However, one indicator does not necessarily imply independence: while TCRA receives its funding directly through licensing fees and levies

² For a more detailed overview of market developments and Tanzania's liberalization strategies see 23. Van Gorp, A.F. and C.F. Maitland, *Regulatory Innovations in Tanzania: The Role of Administrative Capabilities and Regulatory Governance*. Info: The Journal of Policy, Regulation and Strategy for Telecommunications, Information and Media, 2009. 11(1): p. 64-77.

³ By August 2007 market shares for voice providers are: 1. Vodacom with 51% market share; 2. Celtel with 26% market share; 3. MIC Tanzania-Tigo with 13% market share; 4. Zantel with 7% market share; and 5. TTCL with 3% market share. See <http://www.tcra.go.tz/publications/telecom.html>. Last accessed August 6, 2007.

⁴ For a detailed overview of number of subscribers over time, see also <http://www.tcra.go.tz/publications/telecom.html>. Last accessed August 6, 2007.

⁵ See http://www.ttcl.co.tz/about_history.asp. Last accessed August 6, 2007.

⁶ Quote taken from East African Business Week, "TZ Okays More Cellular Firms", 22 May 2006. See http://www.busiweek.com/index.php?option=com_content&task=view&id=1582&Itemid=39 Last accessed August 11, 2007.

⁷ Even though much progress has been made; few challenges have surfaced. Due to the high demand, regulator TCRA was forced to temporarily stop frequency applications for spectrum that includes the common bands for GSM, CDMA, and WiMax, and was forced to review the band plan in 2006. Subsequently, in 2007, plans were initiated to comprehensively survey Tanzania's ICT infrastructure, with an eye towards determining the extent to which further opening of the market in the future is desirable, and to determine the optimum number of operators in the sector, as well as the degree of (lack of) competition in different segments of the market. See also <http://www.cellular-news.com/story/31356.php?source=newsletter> Last accessed May 30, 2008.

by industry, Parliament and Minister play a role in approval of TCRA's budget.

Nevertheless, as per the EURI-I index, there are a number of indicators that would actually suggest 'dependence'. For example, Tanzania's staff number of 97 is far below that in Europe, however for African standards is relatively high [9]. Additionally, TCRA primarily reports to the Minister while the legislature is hardly involved. Parliament does receive TCRA's budget and annual report from the Minister, but no specific approval powers etc. are stated in the TCRA Act of 2003. The board members of TCRA are also not appointed by Parliament, but through a committee established by the Minister. Further, as per the TCRA Act of 2003, the Minister has the power to engage in many regulatory activities. For example, TCRA is not allowed to award or cancel licenses with an exclusivity period, universal service obligations or any license for a term of more than five years without consulting the Minister.

These factors implying certain degrees of dependence vs. independence have also changed throughout the years. In favor of independence is first TCC's evolution from a single sector regulator into a converged regulator responsible for postal, telecom and broadcasting. Second, in some areas the Minister's powers and influence in the regulatory process have decreased. Third, during the time that the regulator was purely in control of telecom, under the name TCC, board members could renew their terms an unspecified number of times, whereas currently more stringent rules apply where board members can only renew their appointment once.

However, regardless of developments in the direction of more independence for the regulator, the Minister is still awarded an extensive formal role. Hence, the question remains: why is TCRA referred to as an "independent" regulator? Particularly interesting is the fact that the incumbent TTCL remains partially state-owned, which in many countries has led to government protection and delayed implementation of liberalization due to incumbent-initiated court proceedings.

First, in Tanzania, little evidence exists of incumbent-initiated court proceedings. In interviews with managers at TTCL's competitors, including mobile operators and ISPs, attempts at delaying the implementation of liberalization mechanisms through court proceedings were not mentioned, and stands in stark contrast with a country like South Africa [see e.g. 9]. There exist two potential underlying reasons for the lack of judiciary involvement. First, Tanzania is known to have a fairly weak judicial system, which has restrained market development in many sectors due to the lack of (threat of) enforcement, leaving government unchecked by law [25, 26]. This may have refrained TTCL from taking action.

A second reason for limited action from the side of TTCL might lie in the problems with management control, which first changed from government to Celtel during TTCL's partial privatization in 2001. Even though in the years after Celtel extended its shareholdership to 65% shares while government remained 35%, problems in management control led to the government taking back management control. In

July 2007 Sasktel International of Canada started a three year contract to take over management control⁸.

Further, Tanzania's broader institutional endowment is known for a highly dominant Executive (including President and Ministers) in national policy making processes. While Parliament has powers of scrutiny, due to the large majority of one party in Parliament, at the end the Legislature thus cannot easily hold the Executive accountable [27]. This might explain the limited role of Parliament in telecommunications matters; besides enacting the TCRA Act of 2003, Parliament's single formal role in relation to TCRA regards to how it may provide funds to TCRA, and that it shall receive TCRA's annual report from the Minister. However, this does not explain the limited role the ministry has played.

The limited attempts at protecting the incumbent may partially be due to the ministry's lack of resources. Currently, the Ministry of Infrastructure Development employs roughly 100 people responsible for departments spanning from postal to transportation, but as of 2006 only 6 staff are assigned to telecommunications and ICT matters [23]. Consequently, the ministry realistically does not have a strong influence on ICT and telecommunications policy or regulation. As one manager from the private sector put it, "the regulator is trying to compensate for lack of policy from the Ministry's side". Furthermore, the manager mentions that the Minister has an overseeing role, but that in practice TCRA is "independent". Another manager says "frankly speaking, the ministry doesn't have enough staff. They should actually give more input". This relative lack of involvement of the ministry in the telecommunications sector might be further reflected in the lack of engagement of operators with the ministry (as opposed to the regulator), as is explained by regulatory affairs managers at two mobile operators.

B. Botswana Case

Regulation and Wireless Market Development in Botswana

The case of Botswana shows a very different history of regulatory quality and wireless market development than Tanzania. Botswana, due to its population of 1.8 million, has a very small market with, besides an incumbent fixed line operator, until very recently only two mobile operators. While seemingly a small number of mobile operators, at the time of licensing in 1996 when market liberalization started and the Botswana Telecommunications Authority (BTA) was established, many thought that only one mobile operator would be viable due to the small population size. By 2007 already 1.2 million people used mobile phones [28]. But nevertheless, it was felt that competition in the Botswana telecommunications sector developed "unevenly across different regions of the country and at different levels" [29, p. 3], as outside of cities and major districts, provision of telecommunications services often remained limited or even non-existent. A new service neutral licensing framework was

⁸ See e.g. <http://wirelessfederation.com/news/sasktel-takes-over-at-ttcl/>
Last accessed February 18, 2009.

developed in hopes of “this imbalance [to] be corrected” [29, p. 4].

On June 20, 2006 the Minister of Communications, Science and Technology announced the intent to further liberalize the telecommunications sector through five separate changes to license conditions, as well as having the incumbent rebalance tariffs and allowing new entrants to tender for service neutral national licenses [30]. The first five measures were accomplished by March, 2007 through the introduction of the “Service Neutral Licensing Framework in the Era of Convergence” [31]. Prior to the change in the licensing framework, the market was categorized into “Fixed, Cellular, Internet Service Providers (ISP), Satellite and Data etc.” Market segments determined as “non-competitive” were restricted in terms of the number of players within the segment. In Botswana these were Fixed and Cellular, whereas ISPs, data service providers and paging services providers have been determined to be competitive⁹. Hence, only one fixed and two cellular providers were licensed, while a significantly larger number of ISPs and data providers obtained licenses.

The new service neutral licensing framework required the existing fixed and mobile operators (BTC, Mascom Wireless and Orange Botswana) to obtain so-called “public telecommunications operators” (PTO) licenses. Under this license, any one of them is eligible to provide both cellular and fixed services. In addition, all PTO licensees have become eligible to operate the international gateway and to “self-provide” – a relief to mobile operators that previously were required to use incumbent BTC’s backbone. The three PTOs however are still not eligible to provide value-added Internet services. Hence, BTC continues to use its subsidiary Botsnet for Internet services provision [9].

The introduction of a service neutral license nevertheless was a surprise to some market players. As explained by regulatory managers at incumbent BTC, it was expected that a third mobile operator was to be licensed instead of a fully revamped licensing framework to be implemented. BTC applauded this decision, as BTC was “not sure” if it could have applied for a mobile license otherwise – as two managers explain.

Interestingly however, three regulatory staff at regulatory authority BTA explain that BTA actually recommended the Minister to license a 2nd fixed and 3rd mobile operator after stakeholder consultation processes. Nevertheless, the Minister had the authority to either accept or refuse BTA’s recommendations. Further, as a manager at regulator BTA explains, the incumbent BTC lobbied the government – concerned that under BTA’s recommended plan BTC could not have a mobile license. Hence, according to a BTA employee, the Minister decided to convert the three major operators’ licenses into one service neutral license.

Thus, while throughout the years the growth in ICT connectivity in Botswana has been greater than expected, the introduction of the new licensing framework has not

generated a significant new impulse to market entry as it has done in Tanzania. Moreover, even though the PTO market segment shall only in 2009 be considered for further liberalization and market entry [31], as explained at the Ministry of Communications, Science & Technology, “The current regime means there is no intent to get more than three main voice operators”. The future licensing of new national network providers will depend on the Minister, who is in charge of awarding licenses.

Since April 2008 BTC has started its mobile operations under the brand name Be Mobile. Managers from industry explain that indeed more competition is felt due to the regulatory changes. Perhaps as a result of this, more advanced services are introduced: Mascom Wireless has launched a 3G and 3.5G HSDPA network¹⁰, while Orange has introduced the Blackberry in February 2008 on its GSM/GPRS/EDGE network¹¹. And, even though the new regulations had ISPs remain dependent on infrastructure provision by third parties [9], as of July 2008 value added network services (VANS) providers (e.g. ISPs) may tender for Fixed Wireless Access Spectrum in a number of frequency bands [32].

Regulatory Independence in Botswana

Similar to the Tanzanian case, Botswana’s regulator BTA scores well on a number of variables of Edwards and Waverman’s [5] EURI-I index. BTA scores well on (1) multi-member board control, with 5 non-executive members; (2) fixed term appointments of board members (4 years); and (3) experience – with 12 years of experience, Botswana has significant regulatory experience. In addition, BTA has both telecommunications and broadcasting departments, and as such may be perceived as a multi-sector regulator. However, there are separate boards for both sectors.

There are a number of factors related to independence as identified by Edwards and Waverman (2006) that BTA does not score very well on, however. First, similar to Tanzania, the staff number of BTA is low compared to for example European regulatory authorities, at 70 staff in 2006. Nevertheless, for African standards it is very high; particularly when taking into account the low population size of Botswana (1.8 million) [9]. A second factor that BTA does not score very well on is the lack of involvement of the legislature. Botswana’s Parliament (National Assembly) does not have a dedicated communications portfolio committee, and although the Parliament has passed the Telecommunications Act of 1996 as well as the Amendment Act of 2004, Parliament does not have significant formal powers in relation to BTA. It is only eligible to (1) appropriate money for the Authority’s fund; and (2) receive an annual report and auditing account within 30 days after the Minister’s reception of both [33]. This also implies that there are two other factors not in favor of independence: there is no

¹⁰ See <http://www.cellular-news.com/story/33201.php>. Last accessed September 20, 2008.

¹¹ See http://www.orange.co.bw/press_room/news_page.php?newsID=11 “Orange and RIM Introduce BlackBerry for the first time in Botswana”, February 14, 2008. Last accessed September 20, 2008.

⁹ See <http://www.bta.org.bw/licensing.html> Last accessed March 30, 2008.

legislative appointment of board members, and BTA reports only to the Minister. Third, BTA's board members may renew their appointments an unspecified number of times. Finally, the shared roles of BTA and Minister, and BTA's budget, seemingly are indicative of a limited degree of independence. The Minister has the power to interfere in a number of regulatory areas. First, as per the Telecommunications Amendment Act of 2004, the Minister has to approve all licensing of fixed line and cellular telephone service and may set licensing fees. Additionally, the Minister has the "power to make regulations" [33, B101], and thus may interfere in many areas of regulation.

Thus, as much as six indicators have been identified that could imply a low level of independence. Further, some issues are indicative of the dynamics, including reversal, of independence. Especially in its early days, BTA was perceived as a model regulator, and moreover, governance in Botswana in general has been of a high standard. BTA's exemplary regulatory governance and independence is for example reported in a 2001 report by the ITU which states that "the Botswana experience also offers a number of world models. Among these are that BTA has achieved a high level of independence as measured by the lack of influence from the government in implementing its mandate. Its virtually unfettered authority to license operators and self-financing operation may also develop as a world model. BTA further provides good models of strong legal processes in carrying out its regulatory mandate." [22]. Additionally, with regard to licensing, the ITU (2001) report even states that "BTA is one of the rare regulatory bodies that has been given almost complete freedom to decide which services are to be licensed, how many licenses should be granted for each service and which operators are to be awarded a license" [22, p. 27]. Not only the ITU has noticed Botswana's good governance; throughout the region regulators refer to Botswana's strong governance. For example, a former regulator from South Africa perceives BTA to be a "model regulator", which by industry managers and regulators across the Southern African continent is seconded [9]. Botswana's impressive regulatory governance is furthermore acknowledged in previous research. McCormick [34], suggests in her article with the revealing title "Telecommunications reform in Botswana: a policy model for African states" that Botswana has been able to develop a model of policy and regulatory governance known by significant transparency in decision making.

However, the amendments to the Telecommunications Act of 2004 have led to BTA's degree of dependence becoming point of debate. The Telecommunications (Amendment) Act of 2004 substitutes a number of sections of the 1996 Telecommunications Act that give more 'power' to the Minister. In particular, these changes enable the Minister to 1. determine the use of surplus funds that accrue to the Authority, 2. make regulations, on the recommendation of the Board, 3. set licensing fees, and 4. approve all decisions on the licensing of fixed line and cellular telephone service [33]. Thus, a number of decision making powers formerly under the authority of the BTA Board have been transferred back to the Minister. Further, the Minister's control over BTA's

budget has been observed immediately: in 2006, BTA provided to the treasury Pula 10 million, and in 2007 Pula 2.5 million (respectively about USD \$1.5 million and USD \$375.000) [28]. Additionally, the government can now take part of the profits of BTA. A manager at BTA suggests that the Minister taking back power is a trend observed in more southern African countries, including Lesotho, South Africa, and Namibia [9].

Indeed, that these developments represent a transfer of power from the regulator back to the Ministry is confirmed by people in the industry and at the regulator as well. However, while theoretically the Minister does have more power, reality might be slightly different due to underlying resource issues. As one of the Directors at BTA states, "even though the Minister legally has more power [...] at present that is not an issue". Further, another Director at BTA indicates, "there is a lot of consultation between the ministry and BTA – BTA has a lot to say. Liberalization was initiated by BTA. The ministry relies a lot on BTA because it is better resourced". The Director furthermore continues: "The Ministry is really under-resourced. Most work is carried out by BTA. A policy direction should come out, which BTA would then have to implement." This however does not always happen. As the Director continues, "a problem [...] is that BTA basically made the national plan. This is not desirable for checks and balances."

Nevertheless, regardless of these issues, generally speaking Botswana is still perceived by many people, including those directly involved in Botswana's private sector, as having a very good regulator.

V. CROSS CASE ANALYSIS

The cases of Tanzania and Botswana bring to bear two key aspects related to independence: the relation between Minister and regulatory authority as well as sustainability of regulatory independence. First, according to the independence indicators by Edwards & Waverman's EURI-I index [5], Tanzania currently scores better. The difference however primarily lies in terms of board members of the regulatory authority of Botswana being renewable an unlimited number of times. Further, in Botswana, the Minister has significant control over the budget of the regulatory authority.

However, in both countries there are shared roles between the Minister and NRA, and in both countries the Minister theoretically has significant room to implement regulations. The case of Tanzania however showed that even though this formally might be the case, it does not necessarily stand in the way of independence in day to day operations. Due to limited resources at the ministry, Tanzania's regulatory authority has enjoyed full freedom to design regulations, and even has played a major role in drafting policies; which typically is a Ministerial responsibility.

While over the years in Tanzania formal independence has increased, in Botswana it has actually decreased. The Minister's decision to ignore BTA's recommendation to tender for a third mobile operator but instead to allow the

incumbent fixed line operator to start offering mobile services illustrates this point. Thus, the cases provide evidence of independence being a dynamic phenomenon. Under what conditions are reversals most likely? Comparing Botswana and Tanzania one can conclude, although tentatively given the limited number of cases, that reversals are more likely in countries where the government owns a larger stake in the incumbent, and thus has incentives to protect the incumbent.

Finally, the cases provided evidence that suggests that regulation has an important role to play in determining the number of carriers and hence competition, which has been shown to have positive market effects in many countries. Tanzania's implementation of its converged licensing framework with an open approach to market entry led to market entrance of 4 new operators and additionally an impetus to innovation (i.e. the offering of more advanced technologies). Botswana's approach led to significantly less impetus, even though competition of course was stimulated with there being a third mobile operator now.

VI. DISCUSSION AND CONCLUSIONS

This study analyzed the nature of regulatory independence and its influence on wireless market development in Botswana and Tanzania, and as such, the study has implications for theories of regulatory independence in low income countries.

First, we find that traditional notions and measures of independence may under- or overestimate a regulatory authority's status, particularly when the broader institutional context is not taken into account. When other administrative bodies, such as the ministry, legislature or judiciary, are weak, independence of an NRA may generate greater freedoms than suggested by their legal status. As reflected in the case of Tanzania, to date these freedoms have generated positive outcomes for market development. However, this freedom exists with minimal checks and balances, which are typically a requirement for stable political systems. This finding suggests that independence of the regulator should not be assessed solely by characteristics of the regulator itself. Measures must further consider: what is the regulator independent from?

This may be interpreted as a call to return to studies that examined the broader construct of regulatory quality and not just independence. Indeed, some measures of regulatory quality such as the POLCON index, which measures veto points in a government, reflect the existence of checks and balances. However, the checks and balances related to the independence of the regulator are more subtle. As suggested by Samarajiva [19, p. 81] who described the increasing credibility and independence of the regulator in "The incumbent operator appealed against one of the interconnection decisions, and for the first time the appeal went to the courts, not to the political and administrative authorities as in the past." In this case the incumbent may have had the right to appeal to the courts all along, but never needed to.

Indeed, Bauer [11] suggests that complaint records and court decisions may be an adequate measure of one component of independence, as long as they are free of a systematic bias. While specific case records may be difficult to obtain and bias even more difficult to assess, as the above quote suggests, a measure that reflects simply the involvement of the courts may adequately differentiate different levels of independence.

Also, the case data, together with other instances of reversals, suggest there are a variety of reasons for these reversals, which may be more or less strategic. The case of Botswana reflects a strategic reversal in that it enabled the ministry to create market conditions favorable to the incumbent. However, for example the regulator in Sweden, which was recently identified by the EU as needing greater independence due to a court ruling that resulted in reduced powers for the regulator¹², reversals can occur for other reasons as well. This together with the previously mentioned declines in independence reported in the EURI-I index (see section 2.3), indicate that independence reversal is an issue common to both high and low income regions. Hence, a more nuanced understanding of the dynamic aspects of independence, as well as the day to day practices in case of shared roles between Minister and regulatory authority, as well as the causes and market effects of reversals is required. Further, insight into reversals in regulatory independence may also contribute to understanding reversals in the more general realm of regulatory quality [see e.g. 35].

Finally, the research findings reported here and elsewhere suggest that regulatory independence has different effects on fixed versus wireless market development. Indeed, the lower levels of regulation in these markets and their rapid growth across all nations, independent of institutional arrangements, has led some researchers to question the role of regulation altogether. First, these questions may be more salient in high income countries where the diversity of checks and balances is in general greater. Second, if indeed the effects of regulation on traditional measures of market development such as teledensity and efficiency are universal, it may be that new measures of market development are needed. The case of Tanzania suggests that measures such as the diversity of technologies and speed of transition to advanced technologies, both likely important to consumer satisfaction and to enhancing the true benefits of wireless technologies, may be fruitful areas for future research.

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¹² See "Commission opens three new cases on independence and effectiveness of telecoms regulators in Latvia, Lithuania and Sweden", IP/08/1343, September 18, 2008. Retrieved from <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/08/1343&type=HTML&aged=0&language=EN&guiLanguage=fr>. Last accessed September 22, 2008.

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