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The influence of Regulatory Environment on Mobile Phone Service Quality: The Case of Bangladesh

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The influence of Regulatory Environment on Service Quality: The case of Bangladesh Mobile Phone Sector

ABSTRACT

The role of the state and regulation is considered vital to uphold consumer interest in a market-based economy. The article examines the role of regulatory governance in ensuring mobile phone service quality in the liberalised market. Our findings suggest despite the presence of multiple operators, the dysfunctional regulatory regime and lack of competition have resulted in less than expected service quality for the mobile phone consumers. Moderate improvement in the Quality of Service (QoS) was observed in 1998-2004 when the sector was liberalised but not effectively competitive due to poor regulatory monitoring. Significant improvement in the QoS is, however, observed during 2005- 2008. The effective regulatory monitoring and the increased competition in this period forced operators to improve their QoS.

Keywords: Quality of Service (QoS), Competition, Regulatory oversight, Bangladesh Telecommunications Regulatory Commission (BTRC), Quality benchmark, Competition, Reference Interconnection Offer (RIO)

INTRODUCTION

The telecommunication services in Bangladesh were provided until 1989 by the state-owned monopoly provider Bangladesh Telegraph and Telephone Board (BTTB), telecommunications services. In 1989, the Government of Bangladesh opened the telecom sector by awarding licences to two operators; one to operate fixed telephones in rural areas (Bangladesh Rural Telecom Authority); and the other to operate cellular mobile phone and pager (Bangladesh Telecom Ltd-BTL) services. In 1992, Pacific Bangladesh Telecom Limited (PBTL) bought the mobile part of the BTL (Khan 2003).In 1996; three more licences

were issued to three mobile operators, namely GrameenPhone Ltd (GP), Aktel and Sheba Telecom to provide mobile phone service.

Literature review on Regulatory role on QoS and for ensuring Competition

Studies show that regulatory regime has a significant role in encouraging competition and ensure QoS of the telecom sector. A dominant carrier, if unregulated would abuse its power to harm consumers. Choi et.al, (2001) observes that regulatory interventions were necessary to maintain 'sound and proper' competition in the mobile market (Choi, Lee and Chung, 2001:135). It is accepted that an effective and efficient regulator is essential for fostering and maintaining competition within the telecommunications industry in order to deliver cheaper and better quality services to customers (Balasooriya, Alam & Coghill,2006: 391).Regulatory regimes in Hong Kong and Singapore imposed a host of restrictions (such as *ex ante* control and *ex post* regulation) on the dominant firm to prevent abuse of market power and ensure level playing field to have a competitive market (Cheng, 2007). Regulatory function seeks to promote economic efficiency by ensuring competitiveness, flexibility and minimizing restrictive practice (Baldock, 2003). The establishment of a regulatory body is necessary in order to create an effective level-playing field for private operators, and to deliver cheaper and better quality services to customers. Regulatory authorities are often entrusted with the responsibility of ensuring a minimum quality by requiring operators to maintain a minimum threshold quality and ensuring the operators maintain the benchmark (Sutherland, 2007).

Although there are complaints about the poor service quality of mobile operators (*New Age, June 16, 2005)* and poor regulatory regime, no empirical study has been found about the role of the telecom regulator in ensuring QoS in Bangladesh. This article is concerned with regulatory electiveness in regard to ensuring QoS that affected mobile phone users. This was considered appropriate because government policymakers, including telecommunications regulators, have repeatedly declared that it is the impact on the consumer (both residential and business) that should, and does, drive regulatory policy (Xavier, 2000). The purpose of this article is to investigate how QoS measured in different quality parameters namely network performance and customer service has been influenced by the regulatory effectiveness/regulatory governance. The remainder of this paper is organized as follows: Section 2 provides a brief description about research technique used. In section 3 we discuss the theoretical concepts of service quality and the quality indicators for the mobile phone

sector. Section 4 analyses the state of QoS of mobile operators since the sector was opened in 1989 (before 1997) and experience of subscribers regarding mobile phone service quality. Section 5 elaborates the state of the regulatory regime that has impacted the quality of service. Section 6 describes the findings of the study. Section 7 contains conclusions and public policy implications. Section 8 states the limitations of the study.

2. DATA COLLECTION TECHNIQUES

Data for the study has been obtained from both primary and secondary sources. First, a review of data available from secondary sources such as newspaper reports, articles, regulatory and company websites, comments and analysis and other available documents has been consulted. With a view to collecting primary data about the experience of customers on the service quality of mobile phone usage, three focus group meetings of mobile phone users were conducted. The focus-groups consisted of 8 members in each group. They were (1) Focus group comprised of household users, (2) Focus group comprised of business users and (3) Focus group comprised of professional users. The reason for forming groups under three user groups was to have representative views of important segments of users, who constituted representative sections of a large population. As the need and usage pattern of mobile phone for household, business and professional users vary, the inclusion of different users under different groups was expected to help draw conclusions about the broader population of interest.

Focus group members were asked semi-structured & open- ended questions. Focus group members were encouraged and facilitated to share their ideas and interact with each other. Given the large numbers of mobile phone customers, the focus group interview method has been preferred to other data collection techniques as it permitted gathering of a large amount of information from potentially large groups of people in relatively short periods of time. Moreover, focus group meetings facilitated to draw some conclusions about the large population of interest (Stewart, Shamdasani & Rook, and 2007). Focus group research also helped to illuminate the insider's ('emic') perspective (Barbour, 2007).

Moreover, face-to- face interviews of 32 key informants who are senior executives in mobile phone firms, civil society members, academics, bureaucrats and NGO officials) were also conducted to know their views about how the regulatory regime has influenced the QoS of

mobile operators. Additional telephone interviews were conducted on some occasions where the researchers felt necessity for further clarification.

Interviews and focus group meeting proceedings were transcribed as near verbatim as possible and transcripts were cross-checked. Interview transcripts were analysed using the computer-based NVivo qualitative data analysis software.

3 THEORETICAL BACKGROUND- QUALITY OF SERVICE

Quality of telecommunications service depends on both the telephone network and the supporting services. The first is known as 'equipment and system oriented quality' and the second as 'people and process oriented quality'. Equipment and system oriented quality consists of activities directly related to the network while people and process oriented quality consists of activities provided over the telephone network or face to face. The equipment and system oriented quality can be either objective (e.g. percent of access lines served by digital switches) or subjective (e.g. satisfaction with voice clarity).Similarly, people and process oriented quality can be either objective or subjective. Clements (2004:416) advanced the following framework for local telephone QoS:

Table 1: QoS: Two types of evaluation

	Nature of evaluation	
Nature of quality	Objective evaluation	Subjective evaluation
Equipment and system oriented	E.g. percent of access lines served by digital switches	E.g. consumers' satisfaction with voice clarity, network congestion etc
People and process oriented	E.g. average installation interval	E.g. consumers' satisfaction with operator response time

(Source: Clements, 2004:416)

This framework provides a fair understanding of two broader source of quality of service, although it may not be fully applicable to mobile phone QoS. Like local fixed line service, network performance (e.g. service access delay, network set up success rate, call drop rate, service coverage) of mobile operators also depends on both mobile network (equipment and system oriented) whereas customer service depends on people involved in customer care, responding to customer queries and complaints handling issues (i.e. people and process oriented qualities).

Quality consists of: (1) technical sales and planning (2) provisioning of service (3) technical quality of the telephone service, (4) billing, (5) network /service management by the consumer, (6) repair, and (7) technical support (Richeters and Dvorak, 1988 in Clements, 2004). The QoS of mobile telecommunications is usually measured in terms of some common parameters such as call completion rate, call drop rate, voice quality, percentage of complaints resolved within a stipulated time and customer service etc (TRAI, 2008, Sutherland,2007, Australian Communications and Media Authority 2008). Some elements of quality are directly measureable while others are more about perception of quality of the service[2] and of the behaviour of the operators known as quality of experience- QoE).

It is worth noting that there are several distinct conceptualizations of quality (Wang & Lo, 2002). In marketing and economics, Q0S is dependent on the level of product attributes. In service literature, quality is viewed as an overall assessment.

Like other services, there exists an asymmetry of information between mobile phone customers and service providers. Prospective customers lack sufficient understanding of the qualities of the services being offered. They discover the actual quality of services

only after experiencing the service. This asymmetry in information signifies a potential role for the telecom regulator.

4 CUSTOMERS EXPERIENCE ON DIFFERENT PARAMETERS OF QOS OF MOBILE PHONE

In this study we have used three broad areas of quality indicators: network performance (call success rate/call set up success rate, call dropping rate, voice quality), customer service (including calls answered by operators and complaints handling), and inaccurate billing to approximate the QoS. Call success rate refers to the ratio of total number of successful calls established to the total number of call attempts made while call drop rate refers to the unintended disconnection of mobile calls by the network during a 100-second call holding period for each call (IDA, 2008). These QoS parameters were chosen in consideration of the present state of mobile phone service quality in Bangladesh as well as on the basis of earlier work, by Sutherland (2007) on quality of service in mobile networks. The network quality (e.g. call congestion, poor call completion rate), inaccurate billing and poor customer service has been found to be very important quality of service issues in Bangladesh. Sutherland (2007) had found these parameters to be important in explaining QoS of mobile operators.

In obtaining the perceived service quality, we have followed Gronroos (1984) framework of assessing service quality. In this framework, QoS is assessed comparing perceived service with expected service. Customers' were asked to provide their impression about perceived service and expected service. The experience of mobile phone consumers on different parameters of mobile phone QoS, as obtained through interview and focus group meetings, are presented below.

Customer experience with network performance

Network quality/performance

More than two in three or 67 percent interviewees reported that the overall network performance (measured in different quality parameters such as call dropping rate, call

success rate and voice quality) of the sector has improved gradually with the increase in the level of competition. They said that despite the presence of multiple operators in a liberalised market, as they often had to face call drops and non-completion of calls. The overall network performance was rated 'quite satisfied' (around 80%) during the period of 2000-04 and it reached the highest level of satisfaction 'highly satisfied' (90 percent) in 2006-09. However, more than one in five, or 21% percent subscribers reported that despite considerable improvement in the QoS in recent time (2007-2008), they still face network congestion and call drop problems especially in using GraeemPhonoe (GP) network. GP blocked its competitors' (AKTEL, Sheba and TMIB) calls to its network (Interview, 2008). On the other hand, the three other operators took revenge on GP by blocking calls originated from GrameenPhone. In such a scenario, the mobile users were the ultimate suffers. Although the Bangladesh Telecommunication Act 2001, and Interconnection Regulations 2004 empowers the BTRC to impose financial penalty with imprisonment for such deliberate obstruction and anti-competitive practices (such as not providing interconnection on a fair, transparent and non discriminatory basis, or bundling of facilities and associated charges), the regulator remained silent and did not punish the operators for causing large sufferings to the mobile users by obstructing calls from rival networks (Khan,2004). They complained that the role of the BTRC was not at all satisfactory during 1997-2006 in ensuring mobile phone service quality. The complaint about regulatory non-action has been aptly observed by Silva and Khan (2004). In their view, the call `completion rate among the three operators (PBTL, TMIB, Sheba) was approximately 40%.` And it was only 8% when the calls were terminated on the GrameenPhone network (Silva & Khan,2004). The negligence of the BTRC has been reflected in another comment of Silva and Khan (2004), '*When BTRC took over its function from the MoPT, the mobile industry had been suffering from grueling interconnection crisis. Regrettably the commission took no steps to mitigate this crisis'.*

Around four-fifths of the users complained that BTRC has rarely functioned in a way to see operators improve their QoS. This view of users is consistent with the observation of Yusuf & Alam (2009) who observed:

> Weak regulatory regime seems to be largely responsible for the sub-optimal competitive outcome (i.e. high tariffs and poor quality of service) (Yusuf & Alam, 2009).

The poor state of mobile phone service quality has been reflected in the following note of a reputable daily newspaper of the country:

> Perhaps, Bangladesh is the only country in the world, where you can reach such(large) customer base by providing unsatisfactory service. The mobile phone connectivity of the operators is poor. Between the hour of 5 and 9 in the evening, average try is more than 15 to 20 times when you may finally get through' (The Daily Star, 18 August, 2003).

Accuracy of billing

Pre-paid subscribers observed that they are often overcharged for their actual talk time. They complained about inaccurate billing and observed, 'after our talk over mobile phone, at times it happens that we are debited/charged more than our actual talk time'. Other prepaid customers noted:

> Since we flexi-load (paying money in advance through electronic refill system before using the phone) our mobile phone account balance mobile phone companies sometimes charge more against our available balance. The problem is as one user observes, 'we do not have any instrument to establish the complaint of over charge' (Interview, 2008).

Around one-thirds of the interviewees observe, '[e]ven the telecom regulator does not have its own mechanism to prevent mobile operators from adopting such unscrupulous practices' (Interview, 2008). The existence of inaccurate billing was reported in a daily newspaper: 'Complaints are there that often mobile phone firms charge (deduct) its customers more than their actual usage of 1-2 minutes. Even, at times, the operators charged 5-6 times higher tariff and deducted against the available balance (credit) of the prepaid users' (The Daily Inqilab 2008). The problem of inaccurate billing was acute (31% dissatisfied) during 1997-2004/05 when there was neither an independent regulator nor effective competition (because the market was dominated by a single firm and there were alleged collusive behaviour among operators) in the sector. The situation showed a marked improvement (dissatisfaction reduced from 31 percent to 9 percent) with the increase in the regulatory effectiveness and competition since 2005 onwards. The launch of mobile phone services by the state-owned Teletalk Bangladesh Limited and the private operator Banglalink, having enough clout and determination to challenge the market leader, infused strong competition. The initiative of the newly constituted BTRC to monitor QoS such as by instructing the operators to improve service quality and setting example by then that if its directives are flouted, operators would surely be punished helped QoS to improve. This initiative however, began only in 2007.

Table-1 shows that overall satisfaction level with billing performance. It was 69 percent in 1997-2004/05. The satisfaction level with billing performance increased to 89 percent in 2005 onwards. If we compare billing related benchmark (for pre-paid segment) with the customer perception level, it is found that none of the 6 operators is yet to reach > 90 percent benchmark, a benchmark commonly followed by telecom regulators in countries with similar telecom development such as TRAI, India.

Table 1 goes about here

Competition, Customer Service and Complaint handling Procedure

In reality, pure competitive markets rarely exist. However, it is possible to differentiate between different eras on the basis of the degree of competition. This is because, competition is a matter of degree rather than a situation which is either fully present or absent (Baldwin and Cave 1999 in Balasooriya, Alam & Coghill, 2007:619). The differing degrees of mobile phone sector liberalization and competition experienced in Bangladesh are grouped into three: (1) the monopoly period (before 1997) as only one operator was in operation;(2) the period of limited competition (1997-2004) when were in cartel (Kibria 2005). GP was the dominant operator controlling more than 60 percent of the market share and others were marginal providers in this period and (3) 2005-onwards (periods of stiff competition). Since 2005, the sector has been experiencing stiff competition for two reasons:

(1)Launching of mobile phone services by the state-owned operator TBL; and

(2)Launching of mobile phone services by Banglalink, a strong competitor with large capital base, modern technology, multinational experience and strong determination to engage in head on collision with the market leader through adoption of aggressive and innovative marketing strategy

Table 2 shows the reactions about the impact of regulatory effectiveness and competition on the customer service. The respondents reported that the improvement in the customer care services varied between different periods depending on the role of telecom regulator and degree of competition (number of operators and the struggle to acquire market share) in the sector. During the period of limited competition (until 2004-05) and regulatory ineffectiveness, customer care services were very limited and were mainly confined to capital

city, divisional headquarters and in some large districts. Until November, 2006, customer service through online was not operational (Interview, 2008; focus group participants, 2008).

*** Insert Table 2 about here***

From table 2, it is also clear that the quality of service in terms of customer service was poor (in the range of 59%-65%[1]) as the satisfaction level was much below the benchmark of 90%. With the increase in the intensity of competition and the increased level of monitoring and effectiveness by the BTRC had resulted in improved customer service since 2006-07. During this period, BTRC implemented Interconnection Regulations 2004 to ensure fair competition and safeguard consumer interest with fairly priced interconnection arrangements. The launching of mobile phone service by a state-owned firm, and the engagement in a head-on collision with the market leader by a new but very strong operator (in terms of capital, technology and aggressive mentality) and the emergence of an effective regulator helped the sector to be competitive

Mobile phone users cited several reasons for their dissatisfaction over customer service and complaints handlings. These include: difficulties and significant delays in connecting to the customer care executive, calls to helpline/customer care are charged (not toll free) (for example, GP prepaid customers have to pay BD Taka 1.00/minute for calls made to helpline), failure to take requested action, inadequate or incorrect advice and no response to correspondence. Previously (in 2004) GP subscribers had to pay Tk. 4.00/minute (Alam, 2007) for helpline calls.

It has been revealed by a GrameenPhone respondent that in many instances, complaints lodged by them are not settled by the customer care centre within a reasonable time period (24-72 hours). Another aggrieved customer noted that despite repeated requests (via phone calls and emails), customer care and complaints handling authority of the GP did not take any action to preserve privacy by barring unsolicited calls (Interview, 2008). The concerned mobile operator however, told the authors that they offer best customer service

[1] the percentage of prepaid customers satisfied with customer service and complaints handling has been determined by taking in to account the total number of "Very satisfied" and "Satisfied" consumers out of the total number of interviewees. Percentage of satisfied customers is calculated using the following formula(s) that is followed as standard market practice: CS=(A/N)* 100 Where, CS= % of satisfied customers A = (sum total of no. of subscribers who were "very satisfied" on customer service parameter + sum total of no. of subscribers who were "satisfied" on the said parameter
N = Total sample size achieved. This implies that if all the customers are either "Very Satisfied" or "Satisfied" the operator can get a rating of 100 percent. On the other hand, if all the customers are "Dissatisfied" or "Very Dissatisfied", the operator gets a score of 0 percent.

in the country, widely known for their service quality and they are always mindful to handle customers' complaints very quickly.

The main factors responsible for poor service quality have been identified. The findings are presented below:

Figure 1 Factors responsible for poor service quality (In order of rating)

	Factors responsible for poor QoS	Rating
1	Poor regulatory governance (enforcement of licensing conditions/regulations regarding interconnection)/lack of public enforcement	Highly responsible for poor QoS (76%)
2	Lack of regulations/directives such as QoS benchmark	Responsible to a large extent (47%)
3	Lack of competition and dominance of one firm	Significantly responsible 58%
4	Lack of neutrality and objectivity and conflict of interest (by the erstwhile BTTB/MoPT)	27% Responsible to some extent

Mobile phone operators conceded that there were complaints about QoS especially with regard to network performance and inaccurate billing. The Chief Executive Officer of a mobile firm named PBTL (Citycell brand) recognized the poor network quality and observed:

'Citycell is in discussions with other operators to find out a solution to the network congestion. Already we have seen an improvement' (Hossain, 2003).

Operators, however, have differed with the opinion of mobile customers about customer care and complaints handling. In their view, they have taken all measures to serve customers better and settle complaints quickly.

5. REGULATORY GOVERNANCE AND SERVICE QUALITY

The regulatory system operative has an impact on network reliability and service quality (Roycroft and Garcia-Murrilo 2000). If quality is not controlled, the telecommunications providers are tempted to maximise profits by reducing costs through a reduction/compromise in service quality (Skudder 2003). A regulatory framework creates an effective architecture to balance consumers' and investors' rights (Cave, Prosperetti & Doyle, 2006). An independent telecom regulator can play this role in the telecom sector. Regulator is also vital to have a competitive market. In the absence of a competition policy, regulation can replace the role of competition policy.

In natural monopolies like telecommunications, regulation may control market power by setting QoS targets and controlling entry and access. Regulators adopt several approaches to determine and ensure service quality such as introducing competition by allowing easy entry of new players and setting quality benchmark/targets. The first option can be effective where the market is less competitive and new entrants deploy a range of technologies and innovative business models. In some cases, the regulator specifies quality of service targets/ thresholds and requires operators to maintain that (Sutherland, 2007, Xavier, 2008). Incentive regulation (such as marginal rewards and penalties[2], absolute fines[3], and quality incorporated benchmarking[4]) is also used in providing incentives to improve services (Giannakis, Jamasb and Pollitt, 2005 p.2258-59). The Telecom Regulatory Authority of India (TRAI) has fixed such benchmarks at >90 for all the broad parameters of QoS and monitors it. In 2008 TRAI conducted Quality of Services audit of mobile and other telecom services to assess service quality of operators in all the 23 telecom service areas/circles (such as Haryana,Chennai) by independent auditors IMRB International. The audit report reveals whether mobile providers' met quality benchmarks on different QoS parameters such as call set up success rate

[2] Under the marginal reward and penalty scheme, companies receive reward or penalty per unit of quality improvement (degradation) that reflect the marginal value that customers attribute to quality.

[3] Absolute fines have a centralised nature in that they require companies to pay a pre-specified amount if quality drops below a threshold. The regulator sets both the amount and the threshold.

[4] Under this scheme (for price cap regulation) a company that delivers increased quality relative to its peers would be allowed to raise its price by an amount that reflects the social value of the increased quality. By contrast, a corresponding price reduction would be imposed on under-performing companies

(CCSR[5]), service access delay, call drop rate, good voice quality, service coverage, customer care, response time for to the customer for assistance and billing credibility and complied with QoS directives (TRAI,2008b). It also conducts customer perception survey to assess QoS (for example, in 2008, QoS assessment survey report was prepared for TRAI by VOICE). Czech Republic and EU countries have established quality standards (indicators) through licensing obligations and telecommunications laws. EU legislation did not stop at setting quality parameters; it also set requirements for the annual publications of the actual levels of quality achieved by telecommunications firms and sanctions for any failure to meet pre-established minimum quality standards (Skudder, 2003).

The State of Telecommunications Regulation in Bangladesh

The mobile phone sector was liberalised in absence of any market entry policy. As has already been stated, in the era of regulatory explosion worldwide, when a proliferation of different mechanisms of control at both the national and global level (Levi-Faur, 2008 in Braithwaite, 2008 p.vii) is being observed, Bangladesh had no telecommunications policy/regulation when it first opened up its mobile phone market in 1989. Further liberalisation was also pursued in 1996 (awarding three licenses) without having any telecom policy/regulation and a regulator. First telecom policy was issued in 1998 while Telecommunications Act was promulgated in 2001. The provisions of these legislations lacked both pro-competitive and incentive regulation to motivate operators increase their service quality. Telecom sector regulator was established in 2002 after long 7 years of the liberalisation of the sector.

In this study, we have looked at two main issues of regulatory governance stated in Guiterrez and Berg (2000):

(1) Enforcement power to regulators and

(2) Neutrality/independence.

As three different organizations namely BTTB, MOPT and BTRC were in charge of regulatory role in the telecommunications sector, in different time periods since 1995,

[5]CCSR was established as the ratio of total number of successful call attempts (establishment) to the total number of call attempts made (TRAI 2008b).

the enforcement power and the neutrality of these organizations has been evaluated in a bid to assess their impact on QoS.

The Role of the erstwhile BTTB as a Regulatory Authority

The telecom sector was regulated [licensing and spectrum management] until 1995 by Bangladesh Telegraph and Telephone Board (BTTB) which had been the sole operator before 1989 (Bhuiyan, 2004). Entrusting an incumbent operator with the authority to regulate the sector was inconsistent with the concept of having an independent regulator .Independent regulator was needed in order to ensure fair and impartial treatment of all operators.

As an operator the BTTB was not a neutral body and was morally unable to regulate the mobile phone sector. This is because as an operator and also as a regulator, there was a 'conflict of interest. The BTTB did not provide necessary interconnectivity to the mobile operators. About 90% of the mobile users had no connectivity with the BTTB network as of 2003 (Hossain, 2003). It has also abused its official position by refusing to sign the internationally standard revenue-sharing agreement with the mobile operators. This refusal of signing revenue sharing agreement resulted in charges on incoming calls by the mobile operators (i.e. calls from the BTTB) (The New Age, June 16,2005b). In terms of enforcement, BTTB had failed to enforce regulatory provisions with a view to protecting subscribers' interest. Indeed, the operators were subjected to very little regulatory oversight when regulatory role was in the hands of the BTTB. Two factors contributed to BTTB's poor record as regulator:

- Conflict of interest- Due to conflict of interest, there appears to have developed a negative mentality to hinder the growth of the mobile operators. It might have happened due to the fear that BTTB dominance will be reduced if mobile operators get full connectivity and enhance their market share.
- Lack of adequate capacity to provide adequate interconnectivity to mobile operator**s**

The Role of the Ministry of Posts and Telecommunications as a Regulator

Instead of creating an independent regulatory body, the GoB transferred the regulatory powers from the BTTB to the Ministry of Post and Telecommunications (MoPT) in 1995.

The MOPT worked as the regulator from 1996 to the end of 2001 (Bhuiyan, 2004). It lacked necessary skills and expertise to exercise the role of a telecom sector (Interviewee, 2008). During this period, the MoPT had hardly taken any initiatives to make operators accountable for poor QoS. Although a rational and effective spectrum management system is a must for having a competitive market, the MoPT was unable to effectively manage the radio spectrum or reap fiscal benefits from the optimal use of this scarce national resource (Silva and Khan, 2004). Monitoring and ensuring QoS was not found to be on the agenda of the MoPT (Interview, 2008).

The Role of the BTRC as a regulator

In 2002, Bangladesh Telecommunications Regulatory Commission (BTRC) was established as an autonomous body (under the administrative control of the MOPT) through the enactment of Bangladesh Telecom Act 2001. The telecom regulator failed miserably to monitor service quality and implement the relevant provisions of the Telecommunications Act. It has been around more than 12 years since the mobile sector was fully liberalized in 1997. But BTRC could not set any quality benchmark, which is considered as an essential tool for continuous improvement of quality of services (Debnath & Shankar, 2008) till to date to ensure service quality for the operators. Such quality benchmarks have been in place in many countries including Australia, India, Malaysia, Pakistan and Singapore. Customers' complaints against the mobile operators' QoS are nothing new in Bangladesh. But apart from the operators' customer service desk, there was no regulatory framework to ensure a minimum standard of mobile phone services (Hasan, 2009). Telecom regulator also did not take any steps (which TRAI of India did) to engage in consultative process with different stakeholders of telecom industry to introduce more competition and help improve QoS (Gupta 2002).

Moreover, in the licensing conditions, no roll out (minimum subscriber) obligation was given for the operators (except Warid Telecom) to fulfil within a set time period (Hasan 2008a). Rollout obligations are common in other countries[6] e.g., In Cyprus, a prime condition in second operator's licence was reaching 50% coverage by 2005 and 75% by 2007) (Symeou, 2009).As a result, AKTEL, CityCell and Sheba targeted high end of the

[6]In Philippines EO(Executive Orders) 109 required all Cellular Mobile Telecommunications Service (CMTS) operators to install at least 400,000 telephone lines within three years (Kim,2002). In Hungary, the mobile operator was obliged to start providing service within 6 months of concession contract and to cover 19 country capitals and 100% of Budapest within 24 months of starting the service (Xavier, 2000 p.814) (Xavier, 2000p.814).

market and showed no interest in extending telecom services to rural areas. The Indian government has imposed a penalty of over Rs 41 crore on Tatas, Rs 31 crore on Airtel and Rs 19.65 crore on RCom and others, totalling Rs 135.60 crore, for not rolling out their networks on time (The Asian Age, 2009; The Prothom Alo, 19 September, 2009).

Majority user respondents perceived that the mobile phone operators had a free rein during 1997-2002 in the absence of an independent telecom regulator. One mobile phone user expressed his strong belief about the inaction of the regulator:

> The BTRC was incompetent and lacked enforcement mentality and power to protect consumer interest. It did not have the right skill or attitude to effectively constrain operators' whim. It showed sheer reluctance in exercising its legal power to uphold consumer interest. It was more tilted towards operators' interest (Interview, 2008).

Despite having legal powers for ensuring industry compliance with licence conditions, codes and standards, the telecom regulator has rarely functioned in a way that ensures compliance in the industry[7]. It failed to solve the long standing interconnection and revenue sharing problem between BTTB and mobile operators (Silva and Khan, 2004). Operators hardly faced any consequences for poor performance. As a result, mobile operators' QoS was far below international standards (Islam, 2006). One reason for BTRC's poor performance is its incompetent and inexperienced leadership. The BTRC leadership (both first and second chairman) had no experience in telecom and were former generalist bureaucrats. The second chairman was found to be an aspirant for the ruling party nomination in the parliamentary election (Khan, 2006) He and his son were sponsored to visit Warid's Head Office in Abu Dhabi by Dhabi group (Khan,2006), the parent company of Warid Telecom International LLC. This visit by the telecom regulator hosted by a 'would be mobile phone operator' entailed a 'conflict of interest' because providing such undue benefits appears to have helped Warid to capture the regulator and to influence the license -awarding decision in its favour. This explanation is consistent with *'capture theory'* of regulation[8] (Stigler, 1971 in Viscusi, Vernon and Harrington,2005). This represents a classic example of corruption and regulatory

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[7]The Australian Communications and Media Authority (ACMA) monitors service provider performance against the Customer Service Guarantee (CSG) on a quarterly basis It also monitors the effect of regulations to ensure they are responsive to the community's needs (http://www.acma.gov.au/webwr/_assets/main/lib310751/dec_2008_t-comms_performance_data.pdf).

[8] This theory found that regulated groups were able to 'capture' the agencies which regulate them, This regulated group is the powerful minority against the interest of diffuse majority (who favour regulation). This minority regulated group tries and become successful in capturing regulatory agencies to ensure regulatory decisions are consistent with their interests (Berry, 1984).

capture by the private sector. Although the regulatory body was in existence from 2002, it could not demonstrate its enforcement powers. It seems the BTRC leadership was somehow influenced by the regulated firms not to enforce any measures that disadvantaged them. It has been rightly commented, 'malpractices crept in the sector because of the laidback policy followed by the regulatory top brass in the past' (Hasan, 2009a). In developing economies these malpractices are common as reflected in Braithwaite (2006), '[I]n developing economies the greater risk is the reverse: big businesses networked with ruling families dominate an anti-regulation consensus lubricated by bribery and extortion (2006 p.893).

It has already been stated that until 2006, mobile operators had given minimum regards to customers' rights by mostly ignoring their complaints (Khan, 2004). Before the non-partisan caretaker government took over the power in January 2007, many regulatory instructions of the BTRC (such as urging operators to ensure interconnectivity) took the form of non-binding recommendations, and administrative guidance. In few cases, BTRC uttered some cautionary statements such as 'severe punishment will be taken if the operators fail to resolve interconnection problems bilaterally' (The Daily Star, 2005). These statements were later found to be rhetorical because the non-binding recommendations given on interconnection and pricing issues were more flouted than followed by the operators. Interconnection problems persisted long after this warning as the BTRC was not sincere and committed to implementing its direction.

Allegation was also there that BTRC was not neutral as a regulatory body. A newspaper report says:

> The regulator has been unlawfully sympathetic to BTTB. The state-owned telecom monopoly pays nothing for the radio frequencies it has been using. The regulator defends with the lame excuse of not knowing the frequencies BTTB uses (Khan, 2004).

The operators (except TBL, and Warid) however, blamed the erstwhile BTTB and the regulator for their inability to ensure quality of service. In their view, inadequate interconnectivity by BTTB, and inadequate and unfair frequency allocation by the regulator (this view is also supported by Shams, 2006) hampered their efforts to provide quality service (Interview, 2008). They reported that despite repeated requests, they (i.e.GP, Banglalink and AKTEL) were not given adequate spectrum which is crucial to better serve their customers in wireless communications sector. Necessity for spectrum increases with the increase in customers. After long delay, the telecom regulator allocated 17.5 MHz additional spectrum to GP, BL and Aktel in September 2008 (The Daily Star, 2008).

The BTRC officials agreed that lack of regulatory capacity, enforcement mentality and skilled manpower, hampered its regulatory role in the past. It started its activities with 19 officers, five commissioners and lacked necessary staff. It needed to be equipped with the appropriate knowledge of regulation and IT support tools for efficient regulation (BTRC, 2003). Skill shortage was a reason for BTRC not being effective in regulating quality of service matters. The BTRC has no gauge or mechanism to measure service quality of the operators. Moreover, it was reluctant to such an extent that it did never conduct any market survey to assess the service quality (Interviewee, 2008).

The poor regulatory governance in the telecom sector was highlighted in previous studies by Silva and Khan (2004) as well:

Figure 2 Telecom Regulatory governance in Bangladesh

Dimensions	1989-2003
Market entry	Poor
Access to scare resources	Poor
Interconnection	Poor
Tariff Regulation	Unsatisfactory
Regulation of anti-competitive practices	Poor

(Source: Silva and Khan, 2004 p.21)

The only achievement that BTRC achieved was in issuing PSTN licenses. BTRC issued 19 PSTN licences in the FY 2005-06 in a bid to infuse some competition in the sector. The PSTN operators could not work because of discriminatory policy of the BTRC (Hasan, 2008)

Recent experiences about QoS

The launching of mobile phone service by state-owned Teletalk and the emergence of Banglalink as a tough competitor having necessary clout and skills to challenge GrameenPhone turned the market into a competitive one since 2005-06. Competition became fierce when the re-constituted BTRC (in 2007) with its new leadership started to actively monitor the activities of the operators and the quality of their service, and opened a complaints cell in the BTRC to receive and take action against genuine complaints of poor performance by the operators (Interview, 2008). In such a competitive market scenario, operators have undertaken different initiatives such as increased investment in network assets, signing interconnection agreements with other operators, entering into

infrastructure (Base Transceiver Stations (BTS), towers, poles and transmitter equipment) sharing deal with fellow competitors and staff training.

In order to better position themselves in the cut throat competitive market, the mobile operators have opened up 24/7 customer care helpline very recently. For example, the biggest operator GP opened its online helpdesk in December 2006 (Interview, 2008). Before 2006, GP had customer service centres in a very limited scale but those were more of sales centres than service centres. Other operators have also established online helpdesks in the last two years or so. The operators also set up their customer care centres across the country to better serve their customers. Significant improvement is being observed in service quality in the last 2-3 years. Overall, QoS of the mobile operators increased significantly in the period of 2005 onwards for two reasons (1) high competition among operators following the entry of public sector mobile firm and launching of services by a private firm with considerable clout and (2) the effective regulatory monitoring by the BTRC since 2007.

6. Analysis of findings

The findings suggest that the extent of competition and regulatory monitoring and effectiveness have had an impact on mobile phone service quality. Despite the presence of multiple operators, QoS did not improve significantly (as expected) until 2004 because of dysfunctional regulatory regime. In accordance with economic theory, effective competition should promote quality of services and service providers failing to meet consumers' needs and expectations in terms of QoS would lose ground to their competitors. Unfortunately, that did not happen in Bangladesh as there are widespread allegations that operators colluded with each other. And majority of the respondents lend their support to the allegation saying that,

In absence of regulations to combat anti-competitive behaviour, operators implicitly colluded not to compete with each other in pricing and quality issues and thus maximize their return by compromising service (Interview, 2008). Secondary data also supported the existence of cartel. In the absence of a strong active regulator, the collusive understanding among the firms had reduced their incentives to compete with each other. Rather the operators were in cartel to maximize their profits at the cost of QoS (Kibria 2005). The result was that liberalisation has not led to competitive markets (Ali 2005).

Despite serious allegation of collusion/cartel, the existence of (tacit) collusion has not been officially investigated and proved. The complaints of cartel among the operators not to

engage in competition cannot also be ruled out easily given the widely held view of the key informants and users as well the claim in national daily newspapers. It seems some kinds of adjustments have existed among the operators which led the operators not to compete during 197-2004/05 when the regulator was relaxed.

In the absence of a separate competition authority, Telecom regulator has to play the dual roles of both the regulator and enforcer. On the one hand, it must fulfil its traditional regulatory duties, such as issuing licenses, and reviewing and monitoring the prices and qualities of the firms it regulates. On the other hand, it is the judge when competition complaints

are brought *against* the regulated firms. In such a situation, the BTRC should have launched an investigation to determine the accuracy of the complaint and protect consumer interests. The reality is that the telecom regulator took no step to launch an investigation into the widely perceived collusive behaviour nor did it solve interconnectivity problems of operators. It was not found to be active in injecting competition in the sector by mandating quick interconnectivity for the new firms on reasonable terms. Infocomm Development Agency in Singapore (IDA) released its *Code of Practice for Competition in the Provision of Telecommunication Services* to facilitate interconnection at reasonable terms (Roehrich and Armstrong, 2002).Under this guideline a dominant firm must use long term average incremental cost (LRAIC) for the computation of most interconnection related service charges contained in its reference interconnection offer (RIO). The RIO allows new entrants to get interconnectivity with reasonable terms without prolonged negotiations or litigations (Roehrich and Armstrong, 2002). The IDA enjoys the power to force amendments to the RIO[9].

Telecommunications Authority (TA) in Hong Kong exercises price control over the incumbent firm (Hong Kong Telecom), particularly prior to the liberalisation so that it cannot cut prices below the regulated level to hinder entry and acquisition of market shares by new entrants (Chen and Lin,2002). Such regulatory initiatives to promote competition in Bangladesh were not found (Interview, 2008).

Moreover, regulatory delay in allocating necessary spectrum to the operators also caused QoS to deteriorate. It showed no initiatives to promote competition in the sector. It seems the telecom regulator rather gave in to the whims and interests of the operators. In the case of

[9] Despite the criticism of IDA for decreasing the role of commercial negotiations, the interconnection experience in Australia, Korea, China and Japan led Singapore people to view that an imposed regulatory outcome, for all its dangers, is the best way to move ahead (Roehrich and Armstrong, 2002 p.39)

Warid, the regulator took immoral benefits from the operator. Similarly, the political leadership and the concerned public managers remained as silent when the interests of subscribers were marginalised (poor QoS, high tariffs) by the operators.

As the sector regulator, BTRC should have issued necessary binding directives on interconnection, pricing, QoS and anti-competitive behaviour. Strict enforcement of licensing conditions[10] could have played a role in ensuring QoS. The regulatory intervention in ensuring interconnectivity for small operators was a must to remedy market failure (market failed to provide quality service). Ensuring equity and transparency in the allocation of spectrum was also a necessity. Rationalization of frequency allocation on the basis of equity could have contributed to reduction of the network congestion. Consideration of the operators' subscriber base could be one option to ensure equity in frequency allocation.

The Current Regulatory Regime (i.e.,BTRC)

The state of regulatory governance in the telecom sector is much improved now compared to its record during 2002- January, 2007. The current regulatory regime (since February, 2007) reconstituted by the non-party caretaker government has taken some initiatives to improve mobile phone service quality. The re-constituted BTRC conducted drive against illegal VoIP practices, made licensing conditions available on website, set price cap for mobile operators, initiated activities to set QoS benchmark and invited public opinion on draft QoS benchmarks. The telecom regulator has recently warned the operators excepting Warid Telecom, that they must improve the networks as well as the quality of their services. Five areas namely the congested network, call dropping, one way connections, echo, other distortion, and poorly targeted automated messaging have been identified by the regulator where operators must improve (Interview, 2008). Mobile phone companies viewed the lack of adequate frequency allocation as the main reason for deteriorating services (Hasan, 2008). With a view to facilitating mobile operators to improve their service quality by freeing the operators from the capacity constraint, BTRC recently allocated additional 17.5 megahertz frequency spectrum to three mobile operators- AKTEL, GP and Banglalink (The Financial Express, 2008a). The transparency in license awarding process has been significantly improved and licenses are now awarded through competitive bidding process. Significant steps have been adopted by the BTRC in the

[10] Licensing agreement had provisions to ensure QoS through service agreement and settlement of complaints. GrameenPhone's license agreement (executed on 11 Nov, 1996) with the Government of Bangladesh (Article 2.7.2 of the said Agreement)

recent period to have public consultation on key issues of telecom sector development such as Public Consultation on Significant Market Power (SMP) Determination & Regulation, Public Consultation on Unified Licensing Regime etc.

7. CONCLUSIONS AND PUBLIC POLICY/MANAGERIAL IMPLICATIONS

Overall, the QoS of the mobile phone sector improved little between 1997 and 2004 despite the presence of multiple operators. The main reasons identified by the respondents liable for less than expected service quality were the poor regulatory governance and the lack of competition in the sector. Although established in 2002, BTRC remained largely ineffective until January 2007[11]. Although, the role of regulatory governance is vital to combat anti-competitive practices, BTRC showed its sheer failure in setting and enforcement of quality benchmarks as found in other countries. It also remained dysfunctional in restraining cartel-like behaviour of the firms who compromised QoS with a view to maximising their returns. At the moment, Bangladesh has enough legal provisions and regulatory rules. What is needed is proper and timely implementation of these regulatory provisions and directives.

The findings also suggest that mere existence of multiple players does not guarantee competitive benefits to consumers in terms of QoS and price. Proper regulatory mechanism needs to be in place to reward high quality service providers and punish and low-quality providers. One of the main duties of a regulator is to promote competition[12]. In the telecom sector, the regulator could have done this through ensuring timely interconnectivity at reasonable price, fair spectrum allocation and through quality and price regulation The regulatory environment appears to have been opposite in Bangladesh because the telecom regulator tended to defend the interest of the operators, in particular, dominant operators and cared little about the interest of individual customers

Allocation of frequency on the basis of operators' subscriber base would ease the pressure on large firms' network and will help improve service. Therefore, policy makers need to be cautious in opening the market and keep in mind that capitalism market-based reforms do not render expected benefits unless they are associated with regulations. It is therefore important that service quality standards and incentives need to be incorporated in the regulation of the

[11] In January 2007, a non-party caretaker government came to power which reconstituted the BTRC.The newly reconstituted BTRC leadership took bold steps in removing malpractices, providing necessary directions on prices and QoS to protect public interest and issuing different telecom related licenses in a transparent way through competitive bidding process.

[12] Info Communications Development Authority in Singapore have taken measures to improve the competitive environment (Findlay, Lee, Sidorenko and Pangestu,2005)

telecommunications sector. Vogel (1996 in Braithwaite, 2008 p.11) found empirically to be Freer Markets, More Rules, but also 'more capitalism, more regulation'. It is also to be noted that entrusting a service provider the regulatory role cannot be effective as we saw in the case of BTTB. Policy makers should make a conscious separation of provider and regulatory functions within the state to have effective regulatory governance.

Government policies need to be revisited and significant changes be made (such as strict licence conditions, benchmarking of QoS) so that better competitive environment emerges to meet customer expectations.

However, setting up of an independent regulator is not enough to ensure customers enjoy benefits of liberalisation and competition. Policy makers and political leadership need to oversee whether the independent regulator is skilled, competent and has been effectively performing regulatory duties. Although the BTRC was largely ineffective and incompetent in proper monitoring of the mobile operators to protect consumer interest, no accountability mechanism was found in place to ensure BTRC works to uphold public interest through promoting competition and restraining anti competitive practices of the operators.

8. LIMITATIONS AND FURTHER RESEARCH AGENDA

QoS is a multidimensional concept. It depends on many dimensions such as technology, investment, quality of regulation, effectiveness of regulatory governance and the extent of competition. This study is focused on the impact of regulatory governance on service quality. The assessment of QoS prior to the present full competitive model relied on the memory of focus group participants and stakeholders' interviewed and it is known that memories are fallible. Moreover the findings in this study are based on key informants' perception about quality which at times might be influenced by subjective judgements. In the absence of quality benchmark, the authors had no other alternative but to depend on users' quality experience and secondary data. Furthermore, there is no other known source (other than few newspaper reports) of data on the QoS in Bangladesh.

Assessment of regulatory effects is subject to significant difficulties because of diverse interest of different stakeholders, subjectivity in perceived service quality and long time needed to observe some quality effects. For example, some effects benefiting consumers, such as lower prices, may not be as welcome to telecommunications operators if this results

in lower profits (Xavier, 2000 pp.817-818). Therefore, conclusions based on such assessment must be qualified and judicious.

Table 1 Consumer satisfaction level with billing performance

	1997-2004	**2005 onwards**
Very satisfied	5%	11%
Satisfied	64%	78%%
Dissatisfied	20%	8%
Very dissatisfied	11%	3%
Total	100%	100%
Total satisfaction level	69%	89%

(Source: compiled from interview findings)

able 2 Consumer satisfaction level (highly satisfied and satisfied)-with customer care and complaints handling service (service provider wise)

Regulator	Period	Very dissatisfied	Dissatisfied	Satisfied	Very satisfied	Satisfied customer %	Reasons
1	2	3	4	5	6	7= 5+6	8
BTTB/MoPT	1989-2001	10%	31%	58%	1%	59%	1.No regulator monitoring; 2.No public policy such as QoS directives or interconnection policy or competition policy 3.Lack of independent regulator 4. Limited competition
BTRC	2002-2004	7%	28%	62%	3%	65%	**1.**Independenet regulator But dysfunctional regulator 2. Limited competition
BTRC	2005-onwards	4%	8%	75%	13%	88%	1. Indepednet regulator 2. Competitive market

							Effective regulator

(Source: Compiled from interview findings)

REFERENCES

Alam, M.F. (2007) 'Customer satisfaction of GrameenPhone Bangladesh', Daffodils International University, 1-39 A term paper submitted on 17 July (http://www.scribd.com/doc/7127346/Customer-Satisfaction-Grameen-Phone-Bangladesh retrieved on 2 March,2009)

Ali, AMMS (2005) Should Teletalk be a non- starter, *New Age Editorial*, April 7

Australian Communications and Media Authority (2008) *Telecommunications Today, Report 4, Customer Satisfaction*, 2008 February

Babakus, E. & Boller, G.W.(1992) Empirical assessment of SERVQUAL scale, *Journal of Business Research*, 24:3, pp253-68

Balasooriya, A.F. Alam, Q. & Coghill, K. (2007) Ownership, competition and regulation under privatization policy: the Sri Lankan experience, *International Review of Administrative Sciences* 73(4): 611-628.

Baldock, J (2003) On being a Welfare Consumer in a Consumer Society, *Social Policy and Society*, 2(1): 65-71

Barbour, R. 2007. *Doing Focus Groups* (First ed.) Los Angeles: Sage Publications Ltd.

Berg, B.L.(2007) *Qualitative Research Methods for the Social Sciences*. 6th Ed. Boston: Pearson

Berry W D. (1984) An alternative to the capture theory of regulation: The Case of State Public Utility Commissions, *American Journal of Political Science*, 28(3): 524-558

Bhuiyan, A. J. M. S. A. (2004) Universal Access in Developing Countries: A Particular Focus on Bangladesh *The Information Society, 20*(4):269-278

Braithwaite, J. (2006) Responsive regulation and developing economies '. *World Development* **34** (5):884-898.

Braithwaite, J (2008), Regulatory Capitalism: How it works, ideas for making it work better, Edgar Elgar, Cheltenham:1-245

BTRC (2009) http://www.btrc.gov.bd/ accessed on 19 September 2009

Cabanda, E., & Ariff, M. (2002) 'Performance Gains through Privatization and Competition of Asian Telecommunications'. *ASEAN Bulletin, 19*(3): 254-279

Camp, L. J., & Anderson, B. L. (2001) Deregulating the local loop: The Telecommunications Regulation Path Less Chosen as Taken by Bangladesh, ***International Journal of Technology, Policy and Management****, 1*:1 pp 100-114.

Cave, M., Prosperetti, L., & Doyle, C.(2006) 'Where are we going? Technologies, markets and long-range public policy issues in European communications'. Information Economics and Policy 18**:**3 pp. 242-255.

Chen, E. K. Y., & Lin, P. (2002) Competition Policy under Laissez-Faireism: Market Power and its Treatment in Hong Kong . Review of Industrial Organization **21** (2):145-166.

Cheng, T.K. (2007) A Tale of Two Competition Law Regimes- The Telecom-Sector Competition Regulation in Hong Kong and Singapore, ***World Competition***.30:3 pp 501-526

Choi, S.-K., Lee, M.-H., & Chung, G.-H. (2001) 'Competition in Korean mobile telecommunications market: business strategy and regulatory environment'. *Telecommunicaions Policy, 25*(1-2):125-138.

Clements, M. E. (2004) Local telephone quality-of-service: a framework and empirical evidence, ***Telecommunications Policy****, 28*:5/6 pp 413-426.

Debnath, R.M. & Shankar, R.(2008) 'Benchmarking telecommunication service in India: An application of data envelopment analysis', ***Benchmarking: An International Journal***, 15(5): 584-598

.

Findlay, C., Lee, R.C., Sidorenko, A. and Pangestu. (2005) 'Telecommunications' In Competition Policy in East Asia(Eds). Competition Policy in East Asia. Routledge, London.

Giannakis, D, Jamasb, T. & Politt, M.(2005) Benchmarking and incentive regulation of quality of service: an application to the UK electricity distribution networks, Energy Policy 33:17 pp.2256-2271

Goode, M. M. H., Davies, F., Moutinho, L., & Jamal, A. (2005) 'Determining Customer Satisfaction from Mobile Phones: A Neural Network Approach', ***Journal of Marketing Management****, 21*(7/8): 755-778.

Gutierrez, L.H. and Berg, S. (2000), Telecommunications liberalization and regulatory governance: lessons from Latin America,' *Telecommunications Policy*, 24(10-11): 865-884

GrameenPhone. (2009) About GrameenPhone: History Internet Retrieved 16 January 2009, from http://www.grameenphone.com/index.php?id=63

Gronroos, C. (1984) 'A Service Quality Model and its Marketing Implications'. *European Journal of Marketing, 18*(4):36-44.

Gupta, R. (2002) "Telecommunications Liberalisation: Critical Role of Legal and Regulatory Regime ". *Economic and Political Weekly, 37*(17):1668-1675.

Hasan, Mahmud. (2008) 'Mobile phone operators in Bangladesh', ***The Daily Star***, 7 January

Hasan, M (2008a) Warid fined Tk 6.67 cr for missing subscribers target, *The Daily Star* January 15
Hasan, M. (2008b) '5 mobile operators told to improve', ***The Daily Star***, February 5

Hasan , M (2008c) Square backtracks on PSTN plan, *the Daily Star*, September 01

Hasan, M.(2009a) Telecom firms seek secure climate, *The Daily Star*, January 07
Hasan, M.(2009b), BTRC moves to ease mobile users' woes, *The Daily Star*, 13 July

Hossain, M. (2003) Citycell eyes taking client care to top tier. ***The Daily Star***, 21 November

Hossain, M (2003) Allow infrastructure firms to ease phone interconnection woes, *The Daily Star*, September 20

Hubbard, R.J. Garnett, A.M. Lewis, P. & O'Brien, A.P.(2009) Micro Economics. NSW: Pearson Education Australia.

IDA. (2008, 19 March). Policies and Regulation: Cellular Mobile Telephone Network Performance for 2007. Internet from http://www.ida.gov.sg/Policies%20and%20Regulation/20060416183441.aspx

Khan, A. S. (2004) Two years track record of telecoms regulator. ***The Daily Star***, February 14

Khan, A. S. (2006, July 1, 2006). BTRC messes up mobile licence for operator. *The Daily Star*,

Khan, M. A. S. (2003) 'Privatization in the telecommunication Sector: An overview of Comparative Bangladesh Situation', ***the Bangladesh Accountant***. *41*:14 pp 29-36.

Kibria, A. (2005) New Age Second Anniversary Special. State Intervention: Free market...with regulation. ***New Age***

Kim, D.-Y. (2002) "The Politics of market liberalization: A Comparative Study of the South Korean and Philippine Telecommunications Service Industries.".*Contemporary South East Asia, 24*(2):337-370.

Nemec, J., Sagat, V., & Vitek, L. (2004) 'Privatisation and Liberalization in the Utility Sector: The case of Telecommunications in the Czech and Slovak Republics', *Public Administration and Development, 24*(4):345-356.

Roehrich, N., & Armstrong, M. (2002) Interconnect outcomes: to impose or negotiate the experience of Singapore, Hong Kong, South Korea and Australia'. *Info* **4** (1):37-47.

Roycroft, T., R, & Garcia-Murrilo, M. (2000) 'Trouble reports as an indicator of service quality: the influence of competition, technology, and regulation'. *Telecommunications Policy, 24*:10-11 pp.947-967.

Ros, A.J. (1999) 'Does ownership or Competition Matter? The Effects of Telecommunications Reform on Network Expansion and Efficiency',*Journal of Regulatory Economics*, 15(1): 65–92.

Rossotto, C. M., Sekkat, K., & Varoudakis, A. (2005) "Opening up Telecommunications to Competition and Mena Integration in the World Economy". *Journal of International Development, 17*(7):931-955.

Salazar, L. C. (2006/2007) 'Competition Drives Growth: The Liberalized Telecommunications Sector in the Philippines' *Regional Outlook. Southeast Asia* (The ASEAN-10), 122-124.

Symeou, P. C. (2009) "Does smallness affect the liberalisation of telecommuications? The case of Cyprus". *Telecommunications Policy* **33** (3-4):215-229.

Silva, H. D., & Khan, A. S. (2004) Regulation and Investment: Case Study of Bangladesh ". *WDR Dialogue Theme Discussion Paper WDR 0311*1-33.

Skudder, A. (2003) 'The Regulation of Telecommunications in the Czech Republic', *European Law Journal, 9*(3): 341-364.

Symeou, P. C. (2009) "Does smallness affect the liberalisation of telecommunications? The case of Cyprus". *Telecommunications Policy* **33** (3-4):215-229.

Shams, M.K.(2006) Cell Phone revolution, *The Daily Star* 15th Anniversary Special, Investment

Sullivan, N. P. (2007) *You Can Hear Me Now* (1st ed.) San Francisco, CA: John Wiley & Sons, Inc.

Stewart, D.W. Shamdasani, P.N. & Rook, D.W. (2007) *Focus Groups: Theory and Practice*. London: Sage Publications

Sutherland, E. (2007) 'The regulation of the quality of service in mobile networks', ***Info*** *9*(6): 17-34.

The Asian Age (2009) Telcos fined for delay in service roll out plan, 20 September, 2009

The Daily Inqilab. (2008) 'BTRC opens 'Complaint website' on different complaints from customers', May 27

The Daily Star.(2003) Letters to Editor, Grameen Phone , 18 August

The Daily Star. (2005) BTRC warns operators over interconnectivity. July 27

The Daily Star. (2006) 'Subscribers face delays for new phone lines', August 2

The Daily Star (2008) 3 mobile operators get extra spectrum, September 7

The Daily Star. (2008). 3 mobile operators get extra spectrum. *The Daily Star,* p. B2, September 30

The Financial Express (2008a) Leading cell phone operators buy addl frequency at Tk 14 b. September 30

The New Age (2005a) **'** NBR's no to SIM card tax cut, ***Front page, June 16***
The New Age (2005b), Mobile phone cos refute Saifur claims, front page, June 16

The New Age (2006), Mobile Operators to slash fees for interconnection, September 30

The Prothom Alo (2009), Few private mobile phone companies in India fined 136 crore Rupee, 19 September

TRAI. (2008a) *Quality of service assessment: Report of Survey for Basic Service (Wireline), Cellular Mobile (Wireless) and Broadband*. New Delhi: TRAI,

TRAI(2008b), Quality of Service - Independent agencies Audit/Survey Reports: prepared by IMRB International for TRAI

Viscusi, W.K. Vernon, J.M. and Harrington, J.E. (2005). Economics of Regulation and Anti Trust, The MIT Press

Wang, Y., & Lo, H.-P. (2002) 'Service quality, customer satisfaction and behavior intentions: Evidence from China's telecommunication industry', ***Info****, 4*(6): 50-60.

Xavier, P. (2000) "Market liberalisation and regulation in Hungary's telecommunications sector ". *Telecommunications Policy, 24*(10-11):807-841

Xavier, P. (2008) 'Fostering competition in Thailand's telecommunications sector', *Info, 10*(1): 79-96.

Yusuf, M. A., & Alam, Q. (2007) 'Liberalization of the mobile phone sector in Bangladesh', ***The Daily Star***, November 15

Yusuf, M. A., & Alam, Q. (2008) 'BTCL's journey in a competitive telecom market', ***The New Age***: December 7

Yusuf, M. A., & Alam, Q. (2009, 25 May). Market Concentration in Bangladesh. *The Financial Express*