

TELECOM REGULATORY &
POLICY ENVIRONMENT IN
PAKISTAN: RESULTS OF THE
2008 TRE SURVEY

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Table of Contents

1. Executive Summary.....	1
2. Methodology.....	3
3. Development of the Regulatory and Policy Environment	4
4. Telecom Regulatory Environment Survey Results.....	8
i. Market Entry	10
ii. Access to Scarce Resources	17
iii. Interconnection.....	19
iv. Tariff Regulation.....	21
v. Regulation of Anti-Competitive Practices.....	23
vi. Universal Service Obligation	26
vii. Quality of Service.....	29
5. Concluding Remarks and Recommendations	33

Table of Figures

Figure 1: Growth of Subscriber-base, Key Market/Regulatory Event, and Reduction in Tariff	7
Figure 2: TRE Survey Results 2007-08.....	8
Figure 3: Total TRE Score Chart – 2007-08.....	9
Figure 4: Comparison of TRE Scores 2006 vs. 2008 (along six dimensions)	9
Figure 5: TRE Survey Results for Market Entry (2006 & 2008).....	10
Figure 6: Total FDI and its Share in the Telecom Sector	12
Figure 7: Growth in Individual Company’s Subscriber-base	12
Figure 8: Mobile SIMs and SIM Penetration - 2008	13
Figure 9: No of Licensees and Companies Operating in Fixed Sector	14
Figure 10: Fixed Line Subscriber-base and Teledensity - 2008	14
Figure 11: WLL Subscriber-base and Teledensity - 2008	15
Figure 12: Total Teledensity (Fixed + WLL+ Mobile)	15
Figure 13: Broadband Subscribers as of March 2008.....	16
Figure 14: Broadband Subscribers Market Share by Technology as of March 2008	17
Figure 15: TRE Survey Results for Access to Scarce Resources (2006 & 2008).....	17
Figure 16: TRE Survey Results for Interconnection (2006 & 2008).....	19
Figure 17: TRE Survey Results for Tariff Regulation (2006 & 2008)	21
Figure 18: TRE Survey Results for Regulation of Anti-Competitive Practices (2006 & 2008).....	23
Figure 19: Market share in Mobile Sector - 2008.....	24
Figure 20: Market Share in Fixed Local Loop – 2008.....	24
Figure 21: Market share in Wireless Local Loop - 2008	25
Figure 22: Market share in Broadband - March 2008.....	25
Figure 23: TRE Survey Results for Universal Service Obligation (2006 & 2008).....	26
Figure 24: Percentage of Total USF Subsidy Won by the Bidders as of September 30, 2008	28
Figure 25: TRE Survey Results for Quality of Service (2006 & 2008).....	29

Table of Tables

Table 1: Comparison of TRE Scores (2006 & 2008).....	10
Table 2: Foreign Direct Investment in Telecom Sector (in US\$ millions)	11
Table 3: Break Down of Foreign Direct Investment in Telecom Sector	11
Table 4: Internet Facts	16
Table 5: Level of Competition in Different Sectors	23
Table 6: USF Subsidy Granted as of 30 September 2008 (Rs millions).....	28
Table 6: QoS Survey Results by Company (Voice)	31
Table 7: Sample Rating of ISPs done by PTA.....	Error! Bookmark not defined.

List of Acronyms

ARPU: Average Revenue per User
CCP: Competition Commission of Pakistan
DSL: Digital Subscriber Line
FDI: Foreign Direct Investment
FTTH: Fiber to the Home
GDP: Gross Domestic Product
GNI: Gross National Income
GSM: Global System for Mobile Communication
GST: General Sales Tax
HFC: Hybrid Fibre Coaxial
HHI: Herfindahl-Hirschman Index
IMF: International Monetary Fund
IPTV: Internet Protocol Television
ISPAK: Internet Services Providers Association of Pakistan
ITU: International Telecommunication Union
MCP: Mobile Cellular Policy
MNP: Mobile Number Portability
MoIT: Ministry of Information and Technology
MOS: Mean Opinion Score
PTA: Pakistan Telecommunication Authority
PTCL: Pakistan Telecommunications Company Limited
QoS: Quality of Service
RIO: Reference Interconnection Offer
RITR: Reconciliation of International Telephony Traffic Regulations 2008
SMP: Significant Market Power
TH: Threshold
TRE: Telecom Regulatory Environment
USF: Universal Service Fund
USFCo: Universal Service Fund Company
WiMax: Worldwide Interoperability for Microwave Access

1. Executive Summary

Pakistan is the world's third fastest growing telecommunications market,¹ adding on an average two million cellular subscribers per month, following India which is the world's fastest growing mobile services market, adding on an average more than 8 million subscribers per month.² However, Pakistan as of June 2008 had a total of 58.9% access paths/ 100 people compared to 29.08 in India.³ The South Asian region as whole offers a fertile ground for the growth of telecommunications.

The telecom infrastructure in Pakistan is improving dramatically with foreign and domestic investments in the fixed-line and mobile networks. The mobile subscriber base has skyrocketed, reaching 88 million in June 2008, up from only about 300,000 in 2000, 12.7 million in 2005 and 34.5million in 2006. Optical fibre systems are being constructed throughout the country to aid the growth of network. Today network coverage is available to almost 90% of the total population. Tariffs have been driven down to one of the lowest levels in the world. Driven by lowest tariffs, maximum coverage, and relatively better quality the Pakistan mobile market has maintained rapid growth. The mobile market is now working on sustaining the boom that hit Pakistan 2 years back and is now working on adding Value Added Services to increase customer satisfaction. The telecom sector as a whole grew by 80% during the year 2007 compared to the average growth rate of 100% in the pervious four years.⁴

The TRE survey measures informed stakeholders' perceptions about the regulatory and policy environment with regard to the telecom sector in a given country. The current (2008) TRE survey is the second in a series. The first survey was conducted in July 2006 by LIRNEasia in five emerging Asian countries, India, Sri Lanka, Pakistan, Thailand, and the Philippines using six dimensions: i) market entry; ii) access to scarce resources; iii) interconnection; iv) tariff regulation; v) anti-competitive practices; and vi) universal services, for the fixed and mobile sectors. In the 2008 survey, a seventh dimension dealing with the "quality of service" was added, and the survey was conducted for the broadband sector in addition to fixed and mobile sectors, in 8 countries: Bangladesh, India, Indonesia, Sri Lanka, Maldives, Pakistan, Thailand, and the Philippines.

¹ Omantel closes on Worldcall, 11/10/07 AME Info - Telco, Internet and IT;2007 WLNR 22221217

² Highest Mobile User Addition in July, 8/26/08 Statesman; 2008 WLNR 16057985

³ Id.

⁴ PTA, Industry Analysis Report 2007, available at: <http://www.scribd.com/doc/3117277/PTA-Industry-Analysis-Report-2007>.

The survey results for the year 2008 for Pakistan are as follows:

Dimension	Mobile	Fixed	Broadband	Average for Dimension
Market Entry	3.9	3.0	3.2	3.3
Access to Resources	3.5	3.1	3.2	3.3
Interconnection	3.7	3.2	2.9	3.3
Tariff Regulation	3.2	2.7	2.6	2.8
Anti-competitive Practices	2.8	2.4	2.4	2.5
USO	3.2	2.8	2.0	2.7
QoS	3.2	2.7	2.7	2.9
Average for Sector	3.4	2.8	2.7	-

The salient activities that happened in the last year are: (i) a rapid increase in the mobile SIMs/100 people and subscriber-base that is from 39.9% to 54.7% and from 63 million to 88 million respectively; (ii) implementation of mobile number portability in March 2007; (iii) change in the mobile numbering scheme from 7 digit to 8 digits;⁵ (iv) entry of China Mobile with the 100% acquisition of Paktel; (v) entry of other foreign companies through acquiring shares of the local companies; (vi) reduction in the activation fee for mobile connection from PKR 1000 to PKR 500; (vii) launching of WiMax services; (viii) Universal Service Fund (USF) became operative with the establishment of the USF Company and the grant of project for provision of telecommunication services in the rural areas; (ix) USF launched the project to lay optic fiber cable in the province of Sindh to be followed by other provinces; and (x) promulgation of a new competition law and establishment of Competition Commission of Pakistan. All this has led to a higher score of perception in 2008 as compared to the last survey that was conducted in 2006.

	Mobile Sector		Fixed Sector	
	2005-06	2007-08	2005-06	2007-08
Market Entry	4.0	3.9	2.9	3.0
Access to Scarce Resources	3.6	3.5	3.1	3.1
Interconnection	2.8	3.7	2.6	3.2
Tariff Regulation	2.6	3.2	2.7	2.7
Regulation of Anti-Competitive Practices	2.3	2.8	2.3	2.4
USO	2.6	3.2	2.2	2.8
Total Score	17.9	20.4	15.8	17.2

The parameters that have done well compared to last survey are: interconnection, tariff regulation, regulation of anti-competitive practices and universal service obligation in the mobile sector; and market entry, interconnection, regulation of anti-competitive practices and universal service obligation in the fixed sector. The low score for market entry in the mobile sector may be attributed to the perception of some survey participants that the cost of a new/renewal of mobile license (US\$ 291 million) is prohibitive, thus pose a serious barrier to entry. However,

⁵ At present there is 11 digit scheme; previously there was a 4 digit code, now the code is 3 digit, and the phone number is of 8 digits.

what survey participants were not aware of was that the license fee, at least in the case of renewal by Mobilink GSM, was paid in installments over a period of three years.⁶ Thus, lack of accurate information on the part of participants may have skewed the survey results.

In brief, the most active sector was mobile telephony where most of the above-mentioned activities were performed, followed by broadband. Fixed line sector remain somewhat static this year.

With competition now becoming mature in most areas of telecom sector, with the exception of local loop services, and given that lowest average score for dimensions is that of regulation of anticompetitive practices, competition provisions should be strictly enforced by both the Pakistan Telecommunications Authority and the Competition Commission of Pakistan within the scope of their respective mandates. In addition, the regulator needs to focus on improving the penetration and the quality of service for broadband services, in order to transform Pakistan into an “Information Economy” after having tapped and exploited the potential of voice telephony.

2. Methodology

The 2008 Telecom Regulatory Environment (TRE) survey asked informed stakeholders of Pakistan telecom sector to assess the regulatory and policy environment along 7 dimensions (market entry, access to scarce resources, tariff regulation, universal service obligations, regulation of anti-competitive practices and quality of service), on a Likert scale of 1 to 5 (1 being highly ineffective, 5 being highly effective, and 3 being d average). The respondents are selected from 3 categories:

- Category 1: Stakeholders directly affected by telecom sector regulation *e.g.* Operators, Industry associations, Equipment suppliers, Investors
- Category 2: Stakeholders who analyze the sector with broader interest *e.g.*, Financial institutions, Telecom consultants, Law firms.
- Category 3: Stakeholders with an interest in improving the sector to help the public, *e.g.*, Academics, Research organizations, Journalists, Telecom user groups, Civil society, Former members of regulatory and other government agencies, Donors.

The survey was conducted using the online survey tool and hard copies of survey forms. Of the 46 responses received, 24 respondents completed the survey online and 22 respondents completed the survey by filling out the printed (paper) questionnaire. In order to refresh the respondents’ memory, a list of key regulatory event that took place during the period under consideration for the survey 2007-08 was sent along with the questionnaire. Over 100 informed stakeholders (potential respondents) were contacted, out of which 46 responded. 2 survey results were later discarded as they did not answer majority of the questions. The number of respondents for Category 1, 2 and 3 were 15, 15 and 14, respectively.

⁶ PTA. TQR Dec. 07, page 2.

The TRE questionnaire and its evaluation are formulated by LIRNEasia.⁷ All data and statistics relating to telecom used in this report are borrowed from the Pakistan Telecommunication Authority's website, Annual Reports, and Telecom Quarterly Reports, unless specified otherwise.

3. Development of the Regulatory and Policy Environment

The regulatory framework governing telecommunications in Pakistan has its origin in the Telegraphy Act of 1876, promulgated by the Crown in its colony - British India. Upon its independence in 1947 from the British rule, Pakistan inherited and adopted the British legal system, *mutatis mutandis*, including the Telegraphy Act of 1885.

a. *The Telegraphy Act, 1885*

The main objective of the Telegraphy Act of 1885 was to give power to the Government, and to any company or person licensed to provide telecommunication services under the Telegraphy Act of 1876, to place and maintain telegraph lines and posts under and over the property of any person whether private or public bodies.⁸ Under section 7 of the Act, the Federal Government acted as the regulatory authority to control the conduct of all or any telegraphs established, maintained or worked by the government or any other person licensed under the Act.

b. *The Wireless Telegraphy Act of 1933: The Origin of Mobile Telephony Regulation*

In 1933, the Wireless Telegraphy Act was enacted with the objective to prohibit the possession of wireless apparatus without license, as distinct from the establishment, maintenance and working of such apparatus.⁹

c. *Pakistan Telecommunication Corporation Act, 1991*

As a first step towards deregulation, the government of Pakistan corporatized the Pakistan Telephone and Telegraph (PTT) department into a corporation, known as Pakistan Telecommunication Corporation (PTC). The Federal Government was the initial and sole shareholder of the PTC. All employees, assets, liabilities and functions of the PTT were transferred to the PTC.

d. *Pakistan Telecommunications (Re-organization) Act, 1996*

The restructuring of the telecommunication sector started with the enactment of the Pakistan Telecommunications (Re-organization) Act of 1996.¹⁰ The 1996 Act provides for the

⁷ The methodology was developed by LIRNEasia.

⁸ A. Mahmood, *The Telegraph Act*, (Lahore, Pakistan: Mansoor Book House) at 1.

⁹ Gazette of India, 1933, Part V, p.8.; *See also* section 3 of the Wireless Telegraphy Act, XVII of 1933.

¹⁰ Prior to the enactment of the PTA Act, there were a series of ordinances dealing with the almost the same matter. Telecommunications Ordinance, 1995 (XXIII of 1995); Telecommunications Ordinance, 1995 (CIII of 1995); Pakistan Telecommunications (Re-organization) Ordinance, 1995 (CXVIII of 1995); Pakistan Telecommunications (Re-organization) Ordinance, 1996 (XXX of 1996).

establishment of: 1. Pakistan Telecommunication Authority; (2) Pakistan Telecommunication Company Ltd. (PTCL); (3) National Telecommunication Corporation (NTC); and (4) Frequency Allocation Board (FAB).

The Pakistan Telecommunication Authority (“PTA’ or the “Authority”) is composed of three members appointed by the Federal Government for a term of four years. One of the members is nominated as the Chairman of the Authority, and is entrusted with the administrative powers. The functions of the Authority, among others, are to promote the availability of wide range of high quality, efficient, cost effective and competitive telecommunication services throughout Pakistan.¹¹ The Authority is also responsible for safeguarding the interest of consumers, and for encouraging fair competition in the telecommunications sector.

The Act paved the way for the privatization of the PTC by converting it from a corporation to a public limited company. It gave exclusive fixed line telephony rights to PTCL for seven years, which came to an end in 2003. NTC was formed to provide telephony services to government departments and employees. The Frequency Allocation Board is composed of six members with representation from all relevant ministries. FAB allocates and assigns portions of radio frequency spectrum to telecommunication services operators and systems vendors, radio and television broadcasting operations, public and wireless operators and others. Since April 2007, FAB is under the administrative control of the PTA.

e. Information Technology Policy, 2000

In 2000, the Government of Pakistan formed its first Information Technology (IT) Policy. The stated vision is “to harness the potential of information technology as a key contributor to development of Pakistan.” The mission is to rapidly develop the infrastructure while at the same develop excellently trained human resource capacity.

f. Telecom Deregulation Policy, 2003

The exclusive rights to provide fixed telecommunications services of PTCL came to end in 2003, which necessitated opening up of competition in the fixed telephony. The Telecom Deregulation Policy paved the way for bringing competition in the fixed telephony.¹² It seeks to improve the access paths/ 100 people by promoting competition in the provision of telecom services and by ensuring that rural areas get connected (universal service). It also laid out details on license fees, performance obligations, interconnection, and co-location provisions.

g. Mobile Cellular Policy, 2004

In 2004, Mobile Cellular Policy (MCP) was formulated with the objectives to:

1. promote efficient use of radio spectrum;
2. increase choices for customers of cellular mobile services at competitive and affordable price;
3. encourage private investment in the cellular mobile sector;
4. recognize the rights and obligations of mobile cellular operators;

¹¹ Section 4 of the Pakistan Telecommunication (Re-organization) Act, 1996.

¹² [http://www.pakboi.gov.pk/Presentations/IT/De-Reg%20Policy%20-%20BOI%20\(23%20Aug%2003\)_files/frame.htm](http://www.pakboi.gov.pk/Presentations/IT/De-Reg%20Policy%20-%20BOI%20(23%20Aug%2003)_files/frame.htm)

5. encourage fair competition amongst mobile and fixed line operators; and
6. establish an effective and well defined regulatory regime that is consistent with international best practices.¹³

Section 6.8 of the MCP required the implementation of Mobile Number Portability (MNP) by 2006. The MNP was launched in March 2007, and as of December 2007, 118,000 subscribers have been successfully ported among cellular operators.¹⁴

h. Broadband Policy, 2004

In 2004, the government also formulated the Broadband Policy with the objectives to:

- 1 Spread an affordable, 'always on,' broadband high speed internet service in the corporate/commercial and residential sectors across Pakistan.
- 2 Encourage the entry and growth of new service providers while stimulating the growth of the existing ones at the same time.
- 3 Encourage private sector investment in local content generation and broadband service provision.

The policy proposes the following strategy for the achievement of the above objectives:

- a. Removing the existing technical, commercial, operational and legal barriers to the growth of broadband in Pakistan.
- b. Increasing the choice of broadband technologies (DSL, Cable & FTTx, Wireless, Satellite) available to the consumer at affordable prices.
- c. Encourage the development and hosting of local content so as to reduce reliance on the expensive international bandwidth.
- d. Promoting the sale of terminal equipment (PCs, CPEs).
- e. Obligating a pro-active and facilitating role by the largest infrastructure provider PTCL for the growth of Broadband in Pakistan.¹⁵

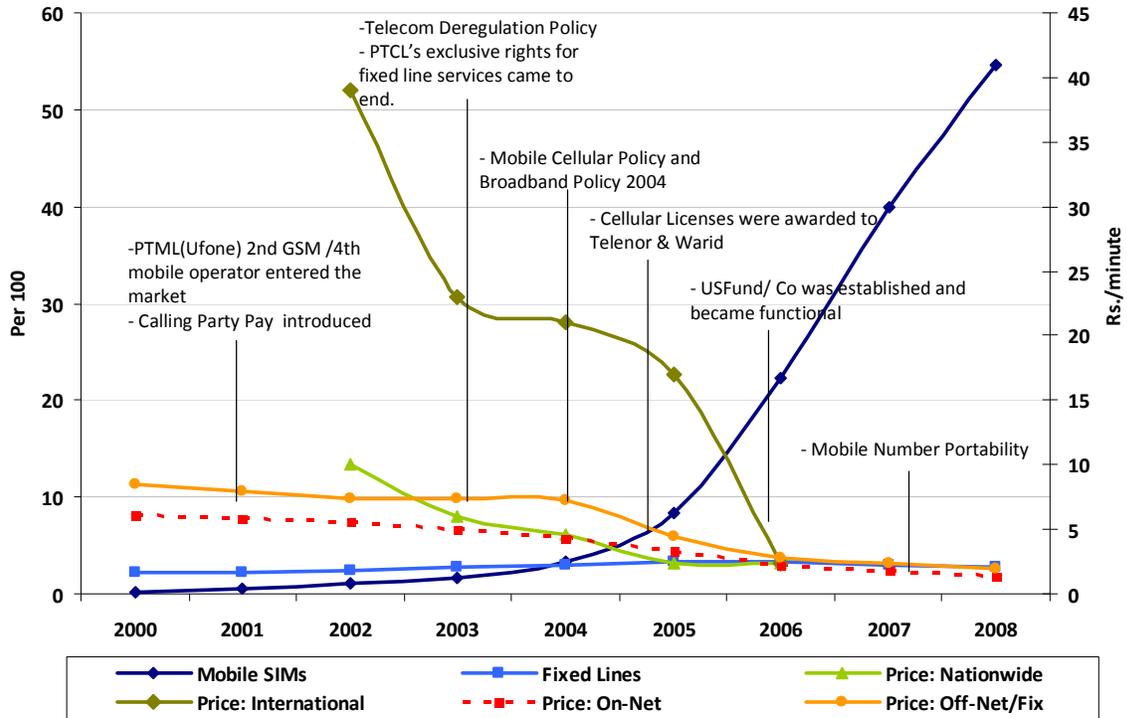
The key regulatory events and a consequent reduction in fixed line tariff from the year 2000 are depicted in the chart below.

¹³ Para 2, Mobile Cellular Policy 2004, available at <http://www.pta.gov.pk/media/MCP.pdf>

¹⁴ PTA., Telecom Quarterly Review, December 2007 at p. 5 available at http://www.pta.gov.pk/index.php?option=com_mediacycenter&catid=94&Itemid=225

¹⁵ <http://www.pta.gov.pk/media/bbp.pdf>

Figure 1: Growth of Subscriber-base, Key Market/Regulatory Event, and Reduction in Tariff



From 2000 onward the PTA started rebalancing PTCL's tariff. Prior to the privatization of the PTCL, it has an uneven tariff structure. It had higher tariffs for International Direct Dialing (IDD) and Nation Wide Dialing (NWD), which could not be justified by the cost. The excess charges were used to cross subsidize the low tariffs of local calls. With the impending opening up, in early 2004, of the fixed-line telephony to competition, the PTA rebalanced the tariffs for IDD and NWD, as it was feared that the new entrants would focus on more profitable segments (i.e., IDD and NWD) and will not invest in local loop services. In that case, PTCL would be burdened with the provision of local services at a loss. Thus in the year, 2001-02, the installation charges for fixed line were reduced from Rs 3690/- to Rs 1850/-, long distance call charges were reduced to 12 percent for international call, and 10.5 percent for NWD calls. The reduction in fixed line tariff was further linked to the adjustment in international settlement rates, and termination rates.

In the fixed market entry was promoted by awarding 12 long distance international (LDI) and 84 local loop licenses for all 14 regions of Pakistan during the year 2003-04. In the same year, frequency spectrum for WLL services was auctioned to 23 companies, and around 108 WLL licenses were issued. However, as of June 2008, only five companies with WLL license are operative.¹⁶

¹⁶ See Figure 9 below.

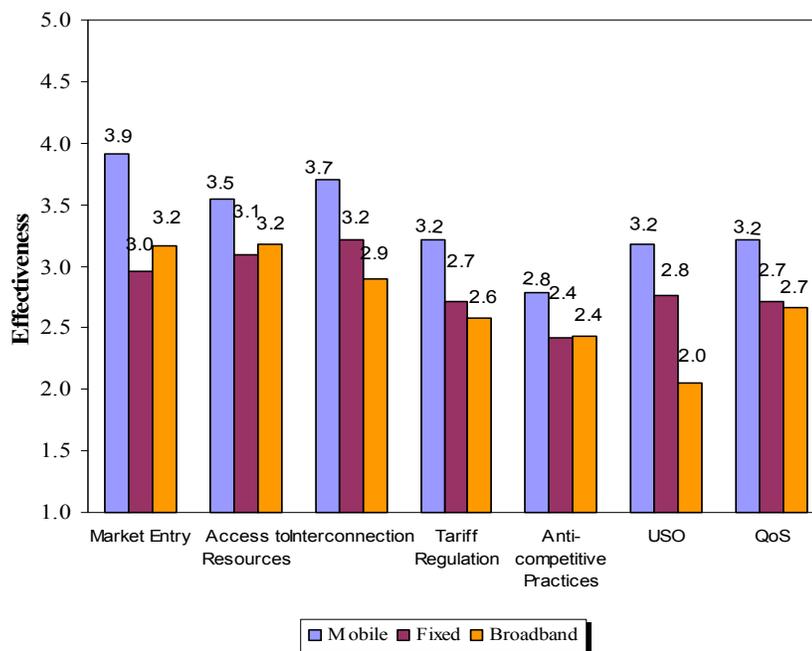
In the mobile cellular sector, a significant change took place in May 2001 when the tariff mechanism changed from Mobile Party Pays to Calling Party Pays. This was followed by award to licenses to Telenor and Warid in 2005. Mobile cellular subscriber-base grew rapidly since the entry of Telenor in March 2005 and Warid Telecom in May 2005. In a short span of three years, the mobile SIMs/ 100 people increased seven times from 7.9% in June 2005 to 54.7% as of June 2008. Telenor’s subscriber-base rose to 18.12 million to become the second cellular operator following Mobilink GSM, and overtaking Ufone. Warid’s subscriber-base also grew beyond 15 million. This is a remarkable growth. The competition offered by the new entrants brought the tariffs down, making it more affordable for the people to subscribe to mobile telephony.

However, the cellular subscriber’s rate of growth declined in the year 2007-08 as compared to the last years. In 2007-08 subscriber-base grew by about 40%, as against 82% in 2006 -07 and more than 100% during 2005-06. Main reason for this slow growth could be the rising inflation and higher taxes by the government, which affects the affordability of the general public. Saturation of the urban markets and the blocking of approximately 7 million unauthorized SIMs by PTA, by June 2008, could be other reasons for the slow growth.¹⁷

4. Telecom Regulatory Environment Survey Results

The TRE survey results of individual parameters for each of the three categories are shown in the graph below.

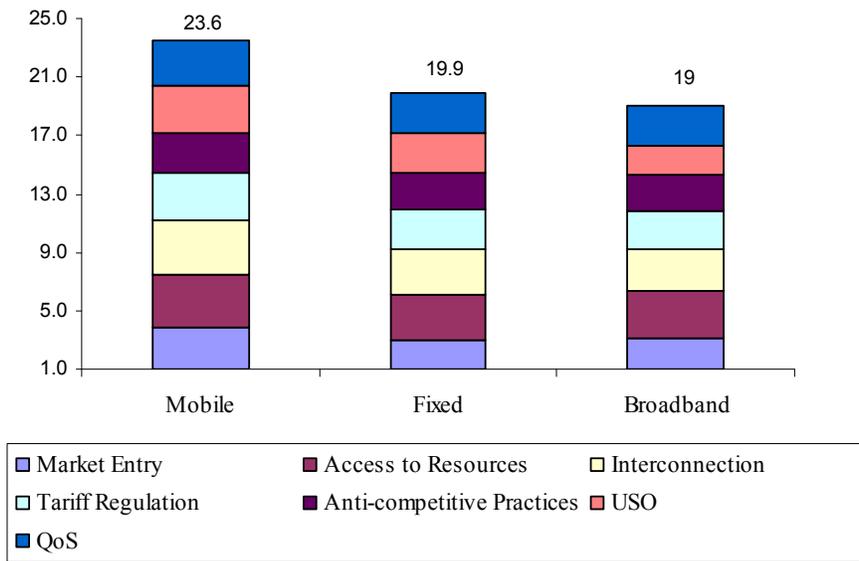
Figure 2: TRE Survey Results 2007-08



The total score achieved by each of the three sectors are show in figure below.

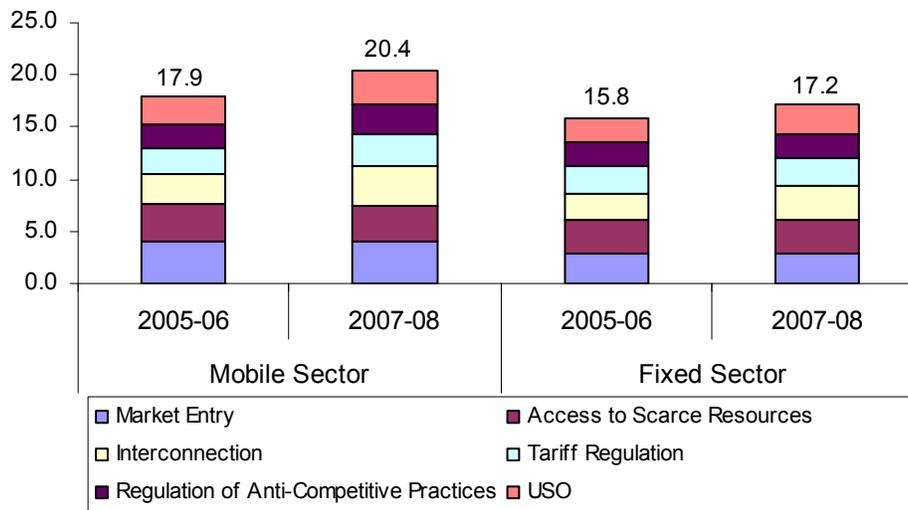
¹⁷ PTA Annual Report 2007-08, at page 31 & 32.

Figure 3: Total TRE Score Chart – 2007-08



From Figure 3, it is evident that the mobile sector performed the best with a total score of 23.6, followed by fixed sector with a score of 19.9 and broadband with a score of 19.

Figure 4: Comparison of TRE Scores 2006 vs. 2008 (along six dimensions)



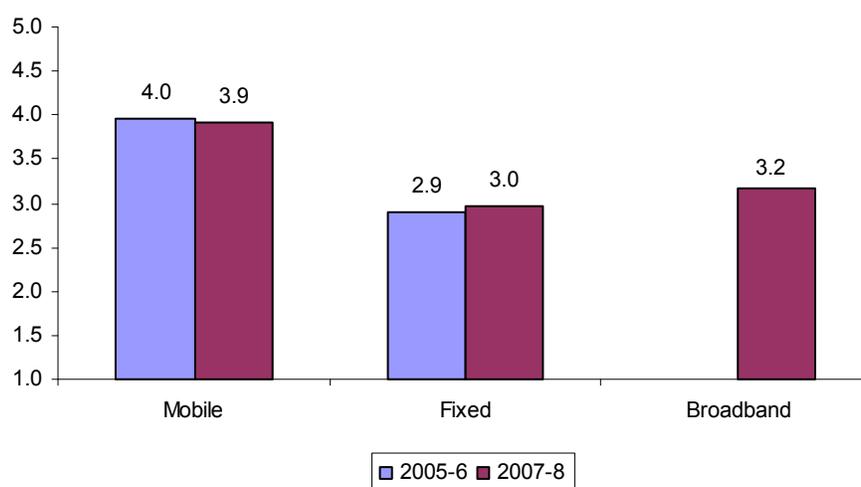
From Figure 4 we see that, in the eyes of the stakeholders, the regulatory environments in both mobile and fixed sectors have become more effective since the previous survey in 2006.

Table 3: Comparison of TRE Scores (2006 & 2008)				
	Mobile Sector		Fixed Sector	
	2005-06	2007-08	2005-06	2007-08
Market Entry	4.0	3.9	2.9	3.0
Access to Scarce Resources	3.6	3.5	3.1	3.1
Interconnection	2.8	3.7	2.6	3.2
Tariff Regulation	2.6	3.2	2.7	2.7
Regulation of Anti-Competitive Practices	2.3	2.8	2.3	2.4
USO	2.6	3.2	2.2	2.8
Total Score	17.9	20.4	15.8	17.2

Both mobile and fixed sectors scored in the year 2007-8 compared to the score they gained in the six parameters that were survey in 2005-6. Here below are charts which compare individual parameters measured in the mobile and fixed sectors.

i. Market Entry

Figure 5: TRE Survey Results for Market Entry (2006 & 2008)



Lack of entry barriers is the hallmark of a competitive market. The Mobile Cellular, the Telecom De-regulation, and the Broadband Polices encourage private investment in the mobile, fixed and broad band sectors respectively. The unbundled licensing regime has encouraged investors to come in, and offer services in the area of their choice.

In line with other emerging markets, mergers and acquisitions (M&A) have been taking place in Pakistan which also attracted foreign direct investment (FDI) and made Pakistan one of fastest growing telecom market. There are no restrictions on foreign investment regarding movement of capital or remittance of profits and dividends.

During 2007 about US\$1.5 billion worth of acquisitions were made in the telecom sector.¹⁸ In May 2007, China Mobile Ltd., a subsidiary of state-owned China Mobile Communications Corporation (CMCC), acquired 100% of Paktel for US\$460 million and renamed it CMPak Ltd. CMCC plans to invest US\$ 400 million in Pakistan to expand the CMPak networks.¹⁹ Orascom from Egypt has purchased the remaining 11.31% shares in Mobilink GSM from the local partners for US\$290 million, and now owns 100% of the firm. SingTel purchased 30% share of Warid Telecom for US\$ 758 million. Oman Tel purchased 60% of World Call for US\$ 193 million.

In August 2007, Mobilink GSM got its license renewed for another term of 15 years by paying a fee of US\$ 291 million. The renewal fee was equivalent to the amount at which the last mobile license was auctioned, as required by the Mobile Cellular Policy 2004. However, given the large amount of renewal fee, Mobilink GSM was allowed to pay the license in fee in 6 installments over a period of three years.²⁰

By the end of November 2007, Mobilink GSM, the dominant player, had invested \$2 billion in Pakistan and in the coming years it is planning to further invest \$500 million. Mobilink GSM has laid 6,000 km fiber optic lines in different cities of Pakistan and after laying additional 500 km fiber optic lines, Mobilink GSM's fibre optic network will be complete in Pakistan.²¹ At present there are six mobile companies²² operating in the country. During the financial year 2007-8, the FDI in telecom stood at US\$ 1438.6 million.

Year	Total FDI	FDI in Telecom Sector	Telecom Sector's Contribution in Total FDI (%)
2001-02	484.7	6.1	1.26
2002-03	798	13.5	1.69
2003-04	979.9	207.1	21.13
2004-05	1524	494.4	32.44
2005-06	3521	1905.1	54.11
2006-07	5124.9	1824.3	35.6
2007-08	5152.8	1438.6	27.92

	Foreign Companies who Invested in Pakistan	Local Companies where investments were made	Percentage of Shares purchased	Amount in US\$ Million
1	Orascom, Egypt (in 2006-7) ²³	Mobilink GSM	11.31 %	290
2	Qtel, Qatar (in 2006-7) ²⁴	Buraq	75%	12.3

¹⁸ Telecom sector fetches \$4.87b, The Nation (Pakistan), February 12, 2008 Tuesday

¹⁹ *China Mobile acquires Paktel for \$460US million*, International Telecommunications Intelligence, May 17, 2007

²⁰ PTA. TQR Dec. 07, page 2. See also, Para 5.4 of Mobile Cellular Policy, 2004.

²¹ *By Romail Kenneth* Mobilink to invest \$500m more in Pakistan, (Friday, November 16, 2007).

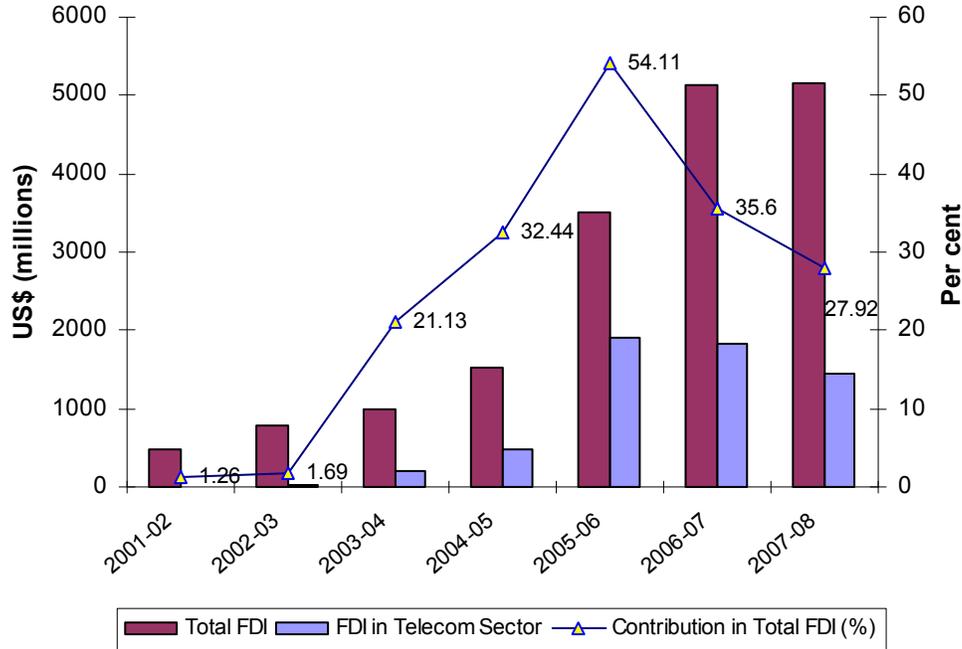
²² Instaphone, CMPak (ex:Paktel), Mobilink, Ufone, Telenor (March 2005), Warid (May 2005).

²³ http://www.otelecom.com/files/media_Files/1681204870_Pakistan%20Minority%20Acquistion.pdf

²⁴ http://robhom.genios.de/r_sppresse/daten/presse_nati/20070522/nati.1275626481.html

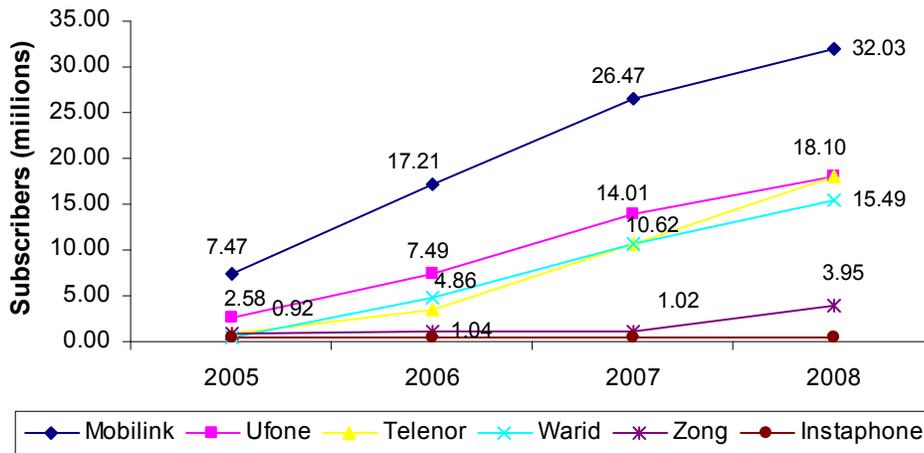
3	Singtel, Singapore ²⁵	Warid	30%	758
4	China Mobile, China	Paktel	100%	460
5.	Oman Tel, Oman	Worldcall	60%	200

Figure 6: Total FDI and its Share in the Telecom Sector



During 2005-06, the telecom sector received over \$US 1.8 billion FDI and emerged as the only sector of the economy to attract such huge investment where its share in total FDI crossed 54%.²⁶ Once the companies enter in the market, the next step for them is increase their market share by increasing their subscriber base i.e., entry leading to penetration.

Figure 7: Growth in Individual Company subscriber-bases

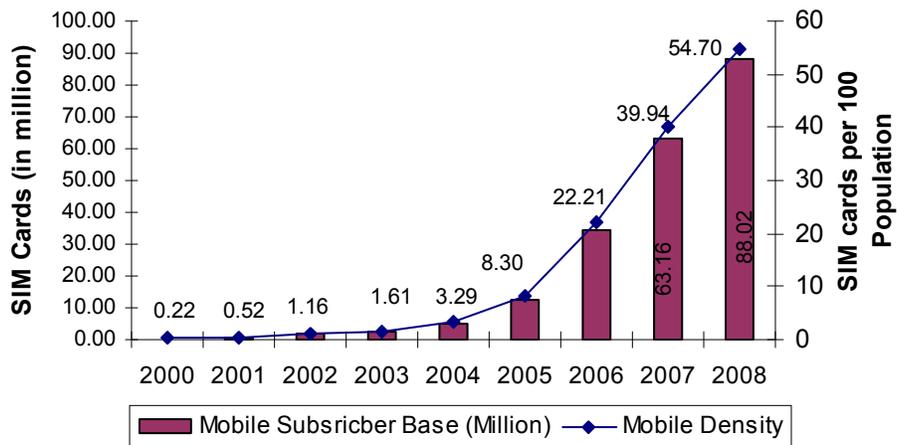


²⁵ <http://www.developingtelecoms.com/content/view/960/26/>

²⁶ The increase in FDI was primarily because of the purchase of PTCL's share by Etisalat.

The mobile cellular subscriber-base grew rapidly since the entry of Telenor in March 2005 and Warid Telecom in May 2005. In a short span of three years, mobile SIMs/ 100 increased seven times from 7.9% in June 2005 to 54.7% as of June 2008. Telenor's subscriber base rose to 18.12 million to become the second cellular operator following Mobilink GSM, and overtaking Ufone. Warid also crossed the 15 million benchmark. This is a remarkable growth. The competition offered by the new entrants brought the tariffs down, making it more affordable for the people to subscribe to mobile telephony.

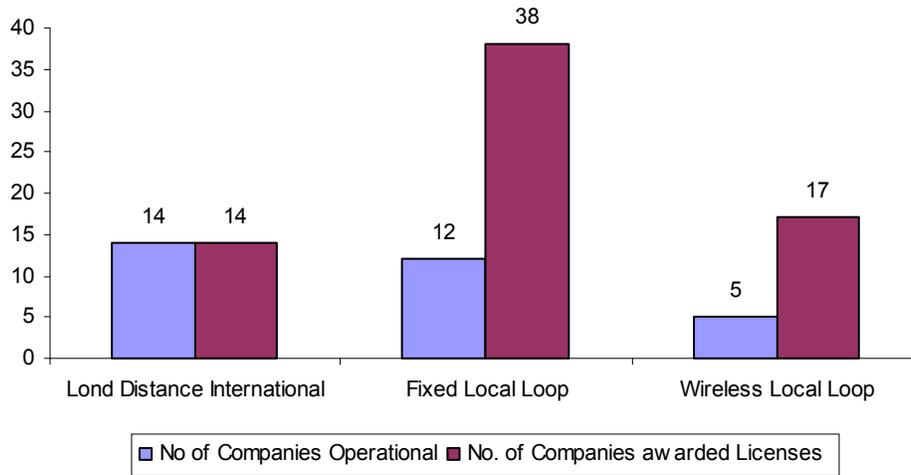
Figure 8: Mobile SIMs and SIM Penetration - 2008



There was a considerable market entry in the fixed sector, which also include wireless local loop as well in the year 2004, right after when the sector was opened for competition.

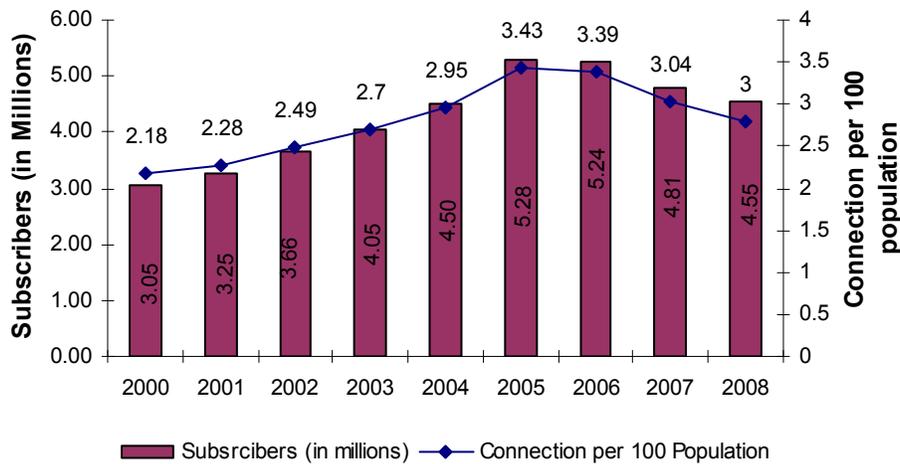
The license for LDI services is nation-wide. For the FLL and WLL services, the territory of Pakistan was divided into 14 regions, and the licenses were issued on regional basis. Some companies got licenses for all 14 regions. As of now, 38 companies have been awarded licenses for FLL, 17 were awarded for WLL services and 14 were awarded LDI services. However, it may be noted that no new licenses were issued in the fixed sector during the period under survey.

Figure 9: No of Licensees and Companies Operating in Fixed Sector



Out of the 38 companies which were awarded FLL licenses only 10 companies are fully operational and 2 are partially operational. Such low number of companies becoming operational is attributed to “high cost of interconnection, transit exchanges and transmission media in addition to duties and taxes on import of communication equipment and obstacles in right of way and co-location.”²⁷ In the WLL sector, operators are using 450 MHz, 479 MHz, 1900 MHz and 3.5 GHz bands. Operators using MHz, 1900 MHz and 3.5 GHz bands have launched their services. However, operators using 479 MHz have yet to launch their services due to lack of off shelf systems. LDI being a profitable segment, all the licensees are operational.

Figure 10: Fixed Line Subscriber-base and access paths/ 100 - 2008



²⁷ PTA, Annual Report 2007, at page 72.

Figure 11: WLL Subscriber-base and Access Paths/ 100 People - 2008

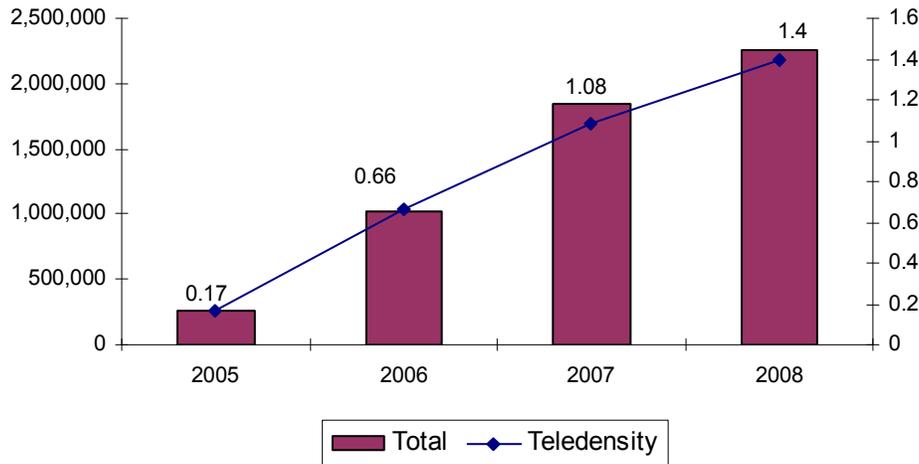
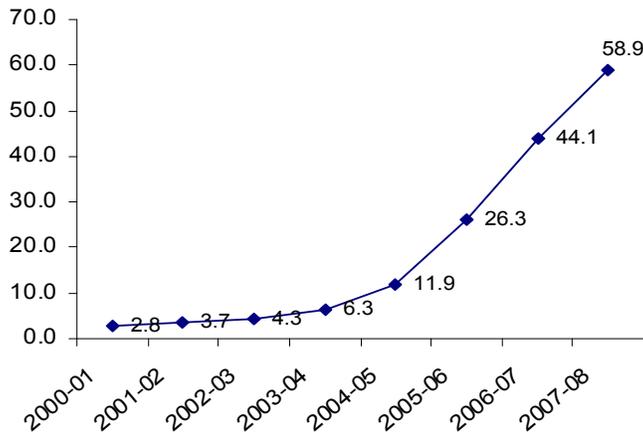


Figure 12: Total Access Paths/ 100 People (Fixed + WLL+ Mobile)



a. Broadband: Market players

Broadband in Pakistan is defined in as ‘Always on internet connection with a minimum download speed of 128 kbps connectivity’.²⁸ The major players in providing broadband services are PTCL and National Telecommunication Company, Worldcall and Wateen. Other ISPs include Brain net, Micronet, Cybernet, Multinet, Dancom, HRI, Nexlinx, CubeXS, Nayatel, Supernet, Telecard and COMSATS, among others.²⁹

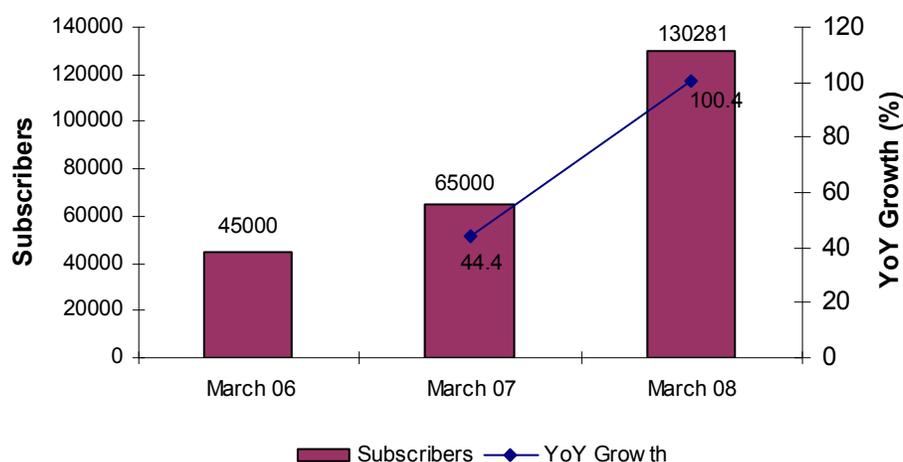
²⁸ Broadband Policy 2004

²⁹ *Current Scenario and Future Prospects: Is entire Pakistan underserved in Broadband Penetration?*, A Study by Ministry of IT, (December 2007) available at: <http://www.ispak.com.pk/Downloads/MoITStudyonBroadbandPenetration.pdf>

Table 6: Internet Facts ³⁰	
Internet users (estimated)	5 million
Broadband Internet users	150,000 (120,000 Digital Subscriber Line (DSL) and 30,000 Hybrid Fibre Coaxial (HFC))
Cost of 2 Mbps IP Backbone connection	US\$ 1,200 per month
Internet bandwidth to Pakistan	~9,000 Mbits combined from PTCL and TWA
Operational ISPs	50 (approx)
ISPs providing DSL services	10
HFC Operators providing broadband Internet over cable	2
Undersea cables connecting Pakistan to rest of world	Two with PTCL (www.ptcl.com.pk), SMW3 and SMW4 One with TWA (www.twa1.com)
Domestic Fiber backbones	PTCL, Wateen Telecom (www.wateen.com), and Mobilink GSM each have their own backbone. A fourth backbone by www.multinet.com.pk is under construction.
Fiber to the Home (FTTH) Providers	There are two: www.nayatel.com and www.wateen.com
Domains Registered under .pk domain	~ 20,000

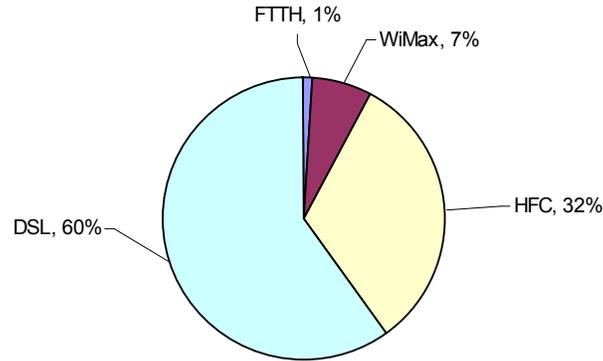
Mobilink GSM has launched WiMax from the first of July, 2008 in Karachi, and planning to launch in other cities by the end of 2008. .

Figure 13: Broadband Subscribers as of March 2008



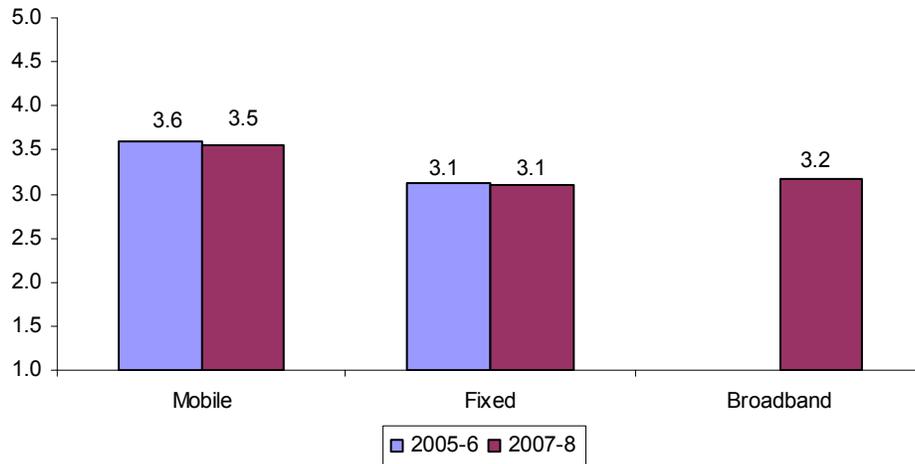
While internet users are around 5 million in the country, the number of broadband subscribers is rather thin standing at mere 130,281 of as end of March 2008. With the launch of WiMax services by Wateen and Mobilink GSM, broadband services will be available in areas which were not hitherto serviced by technologies using wireline (DSL, FTTH, and HFC). This will make the access to broadband open to a wider section of population thereby increasing the subscriber-base and bringing the prices down.

³⁰ <http://www.ispak.com.pk/>

Figure 14: Broadband Subscribers Market Share by Technology as of March 2008

As of March 2008, WiMax has a market share of only 7%, but it is a candidate to take over the market-leader position in the near future.

ii. Access to Scarce Resources

Figure 15: TRE Survey Results for Access to Scarce Resources (2006 & 2008)

The TRE scores for Access to Scarce Resources remain unchanged, though the mobile sector shows a marginal and insignificant decline.

Section 2(qc) of the Telecommunication (Re-organization) Act 1996 defines scarce resources as:

- (i) radio frequency spectrum;
- (ii) right of way; and
- (iii) numbers.

Radio frequency spectrum is the main scarce resource, which is used by both the mobile sector and the fixed sector – wireless local loop being part of the fixed telephony in Pakistan. Section 4 of the 1996

Act requires the PTA to “receive and expeditiously dispose of applications for the use of radio-frequency spectrum.” The Authority allocates radio-frequency spectrum through the Frequency Allocation Board under Section 42 of the Act. The Board acts in accordance with the recommendations of the International Telecommunication Union, its organs, and other international bodies.³¹

Para 4.4.8 of the De-regulation Policy required of the FAB to process applications for the allocation of radio spectrum (RS) within a period of 30 days. For expeditious dealing with RF application and for effective management and monitoring of RS, National Frequency Management and Monitoring System (NFMMS) is established. For monitoring spectrum interference among operators, a number of fixed and mobile monitoring stations have been set up, with state of the art monitoring hardware and software that enables the monitoring stations to effectively monitor the frequency spectrum in various frequency bands. On the management side, National Control Centres are established across the country with the capability of “performing real time and swift analyses of the applications / proposals of applicants and optimizing the use of the available spectrum while securing the license conditions.” The legal requirement of processing applications within a period of 30 days, coupled with technological capability to assess potential interferences with other operators have allowed FAB to clear RS applications expeditiously.

Right of Way is required to roll out infrastructure required for providing telecom services. The PTA grants infrastructure licenses, under section 21 of the PTA Act, to establish and maintain the following Telecom Infrastructure Facilities:

- (a) Earth stations & Satellite Hubs;
- (b) Optic fibre cables;
- (c) Radio communications links;
- (d) Submarine cable landing centre within fifteen miles of costal area of Pakistan subject to approval by the Authority & clearance of Ministry of Defense and Ministry of Interior;
- (e) Towers, poles, ducts and pits used in conjunction with other infrastructure facilities; and
- (f) Such other telecommunication infrastructure as the Authority may, by Regulation, require.

The Infrastructure licensee may lease, rent out or sell end to end links to Telecom Operators licensed by PTA.³²

Numbers being another scarce resource, the PTA has increased that resource by changing the numbering scheme from 7 digits to 8 digits for mobile cellular subscribers as of April 1, 2008.³³ In a 7 digit scheme, there are one million – one (9999999) numbers available for a single prefix. However, with 8 digits a single prefix will not have ten million – one (99999999) numbers available, an increase of 9 millions for each prefix. This is an enormous increase. The waste of the scarce resource of Numbers has been reduced with the implementation of Mobile Number Portability (MNP), which was launched in March 2007, and as of December 2007, 118,000

³¹ *Id.*, Sec 43.

³² http://www.pta.gov.pk/index.php?option=com_content&task=view&id=770&Itemid=613

³³ http://www.pta.gov.pk/index.php?option=com_content&task=view&id=1108&catid=92&Itemid=301

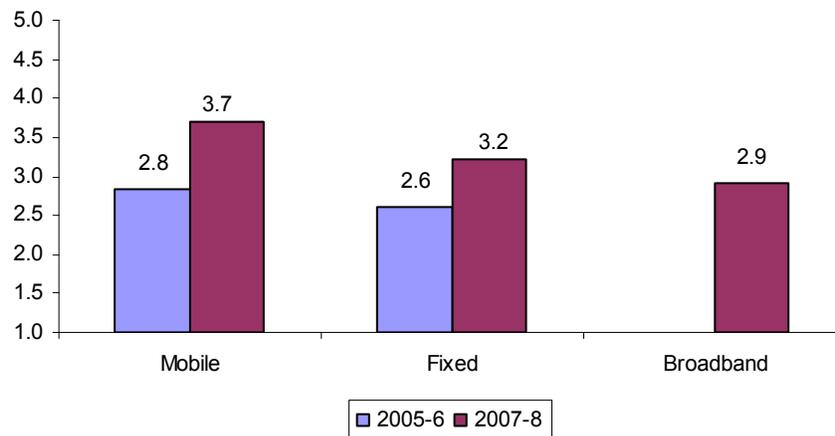
subscribers have been successfully ported among cellular operators.³⁴ MNP allows subscribers to retain the number if they change the service provider. In the absence of MNP, when a subscriber switch to another service provider, her previous number sits in a graveyard for one to two year (depending on company's policy) giving the subscriber an opportunity to get back her original number should she wish to return to the first service provider. This keeps the numbers blocked and thereby reduces the availability of numbers for other subscribers to use.

It is hoped that the new numbering scheme and MNP will help to improve the perception of access to scarce resources at least from the subscribers/consumes' perspective. However, the fixed sector has scored lower than mobile and broadband; one reason for such low rating may be that participants may have included access to the incumbent PTCL's network as part of scarce resources, and therefore giving a negative effect on their perception.

For the broadband, the necessary (or scarce) resources are fiber optic networks, DSL and frequency spectrum. Pakistan Telecommunication Limited (PTCL) has its own optic-fibre backbone. Mobilink GSM also has its optic-fibre network, covering 8,500 kilometers.³⁵ DSL network is rather thin and is available in select areas of major metropolitans, such as, Lahore, Karachi, Islamabad and Rawalpindi. WiMax technology is rather new in Pakistan. Pakistan has earmarked frequency spectrum from 3G services, and will be inviting bids for same shortly.

iii. Interconnection

Figure 16: TRE Survey Results for Interconnection (2006 & 2008)



The perception of interconnections has significantly improved for the mobile and fixed sectors since the last TRE survey was conducted.

Rule 13 of the Pakistan Telecommunication Rules, 2000 [PTR] mandates each operator to negotiate an interconnection agreement with another operator who requests for such

³⁴ PTA., Telecom Quarterly Review, December 2007 at p. 5 available at http://www.pta.gov.pk/index.php?option=com_mediacycenter&catid=94&Itemid=225

³⁵ http://www.dailytimes.com.pk/default.asp?page=2007%5C12%5C26%5Cstory_26-12-2007_pg5_11

interconnection.³⁶ As a general rule, operators are free to negotiate their interconnection agreements in accordance with the procedure laid down by the PTR. However, where an operator has attained significant market power (SMP),³⁷ it is then required “to produce a Reference Interconnection Offer (RIO) detailing the services and tariffs they provide to other licensed operators.”³⁸ Thus, in the case of fixed telecom sector where PTCL has SMP, the PTA, under the Telecom De-regulation Policy of 2003, required a RIO from PTCL, which the latter issued on 15 April 2004. PTA after taking in account the stakeholders’ views confirmed PTCL’s RIO on 6 December 2004.³⁹

The improved perception of interconnection both of mobile and fixed may be attributed to the effect and facilitation of disputes related to interconnection by the PTA.⁴⁰

The perception of interconnection in broadband scored the lowest. There is a Pakistan Internet Exchange,⁴¹ which was set up by PTCL in 2001 to handle traffic between internet service providers on PTCL’s backbone. However, because of PTCL’s dominance over the use of Exchange, there are some issues relating to DSL Interconnect Agreement between PTCL and other internet service providers. The Internet Service Providers Association of Pakistan⁴² (ISPAK) has filed a case before the PTA for the removal of anti-competitive clauses from DSL Interconnect Agreement between PTCL and ISPs, which has not been decided so far.

³⁶ **13. Interconnection between connectable systems.** - (1) Each operator hereinafter referred to as the “**relevant operator**”, shall, on the request of another operator, negotiate an agreement to interconnect that other operator's telecommunication system to its telecommunication system.

³⁷ In order to determine operators who have an SMP status in the relevant markets, Rule 17 of the Pakistan Telecommunications Rules, 2000 has laid down the criteria as follows:

17- (1) An operator shall be presumed to have significant market power when it has a share of more than twenty-five per cent of a particular telecommunication market. The relevant market for these purposes shall be based on sector revenues.

(2) The Authority may, notwithstanding sub-rule (1), determine that an operator with a market share of less than twenty-five per cent of the relevant market has significant market power. It may also determine that an operator with a market share of more than twenty-five per cent of the relevant market does not have significant market power. In each case, the Authority shall take into account the operator's ability to influence market conditions, its turnover relative to the size of the relevant market, its control of the means of access to customers, its access to financial resources and its experience in providing telecommunication services and products in the relevant market.

³⁸ Mobile Cellular Policy, 2004 Section 5.10.

³⁹ http://www.pta.gov.pk/media/ptcl_rio_det.pdf.

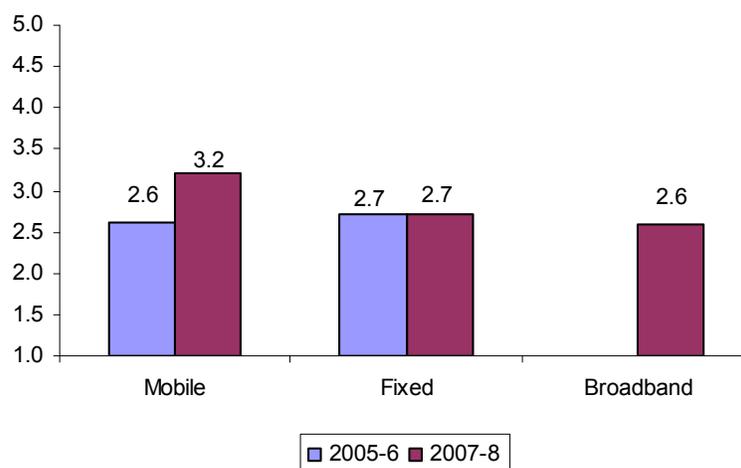
⁴⁰ See for example: Determination on M/S PTCL CED Case, http://www.pta.gov.pk/images/stories/kashif/PTCL_CED_Case.pdf; Dispute between PTCL & LDI operators Regarding Origination Charges on 'Non Revenue Time' of PCCS [http://www.pta.gov.pk/media/Determinon_Non-Revenue_Time\(Final\).pdf](http://www.pta.gov.pk/media/Determinon_Non-Revenue_Time(Final).pdf); Nayatel vs. PTCL, http://www.pta.gov.pk/media/nayatel_ptcl.pdf; Cost-based Interconnection Charges for Fixed-line and Mobile Operators http://www.pta.gov.pk/media/det_cost_140508.pdf

⁴¹ An Internet Exchange (IX) acts as a junction between multiple points of Internet presence. Here, peers are able to directly connect to each other to exchange local Internet traffic. <http://www.spider.tm/aug2003/coverstory.shtml>

⁴² <http://www.ispak.com.pk/>

iv. Tariff Regulation

Figure 17: TRE Survey Results for Tariff Regulation (2006 & 2008)



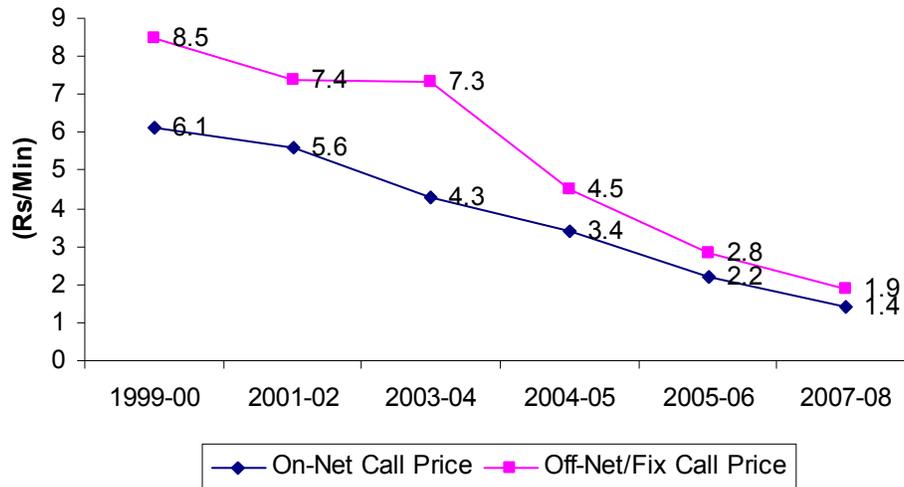
In the mobile cellular sector, a significant change took place in May 2001 when the tariff mechanism changed from Mobile Party Pays to Calling Party Pays. Since then there has been significant reduction in the cellular mobile tariffs.

Mobile cellular operators who do not enjoy a dominant position or SMP (defined as an operator with a market share of over 25%) are free to set and revise their tariffs. However, SMPs tariffs' are regulated by the Authority. In its Determination No. 15-46/01 (Tariff)/PTA dated 25th August 2004, the Authority has declared Mobilink GSM as the SMP in the mobile cellular telecommunications market across Pakistan, and PTCL as the SMP in the LL and LDI fixed line telecommunications market across Pakistan. In the case of SMPs, tariffs are regulated by the PTA.

Tariff may be regulated either through market forces or regulatory body. The market forces, where they are operative, that is, mobile sector have brought the tariffs down. Pakistan is one of the four countries (other three are: Bangladesh, India and Sri Lanka) that offer the cheapest rates in the mobile telephony.⁴³

⁴³ See *Mobile Benchmarks by LIRNEasia* available at <http://www.lirneasia.net/wp-content/uploads/2008/03/08-02-baskets-explained-v41.pdf>; see also <http://www.hindu.com/2008/06/15/stories/2008061555390900.htm>

**Figure 7: Tariff Reduction –Mobile
(Weighted Average Tariff Excluding Taxes)**



For the fixed line sector, since Pakistan Telecommunications Company Limited (PTCL) enjoys the status of an SMP operator, and that there is not enough competition. The perception (TRE score) has declined since 2006 because tariffs in the fixed sector have gone upwards. PTCL has revised its tariffs, with the approval of the PTA, and reduced the time of the unit from 5 minutes to 2 minutes.

However, the PTA has announced cost-based interconnection (termination) charges for fixed-line as well as cellular mobile operators vide its recent determination. This has reduced Mobile Termination Rates (MTR) with effect from 1 June 2008 by 28% i.e. from PKR 1.25/- to PKR 0.90/- over a period of two and half years i.e., by the end of 2010. “It is expected that the reduction in MTR would reduce fixed to mobile tariffs as well as off-net tariffs for cellular mobile operators resulting in more affordable telecom services for the general public.”⁴⁴

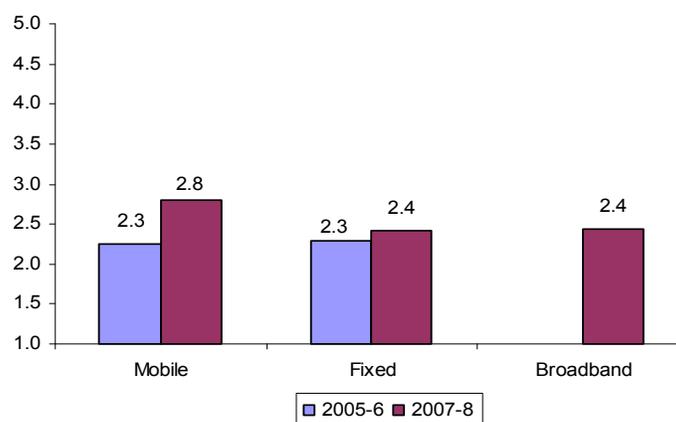
For the broadband the prices have come down and are expected to come down even further with the launch of WiMax services. As of October 20th 2008, PTCL has offered pre-activated free dialup internet facility to all its subscribers.⁴⁵ While this move by PTCL will no doubt increase the number of internet users/subscribers in Pakistan, the effect could be to push all small ISPs out of the market.

⁴⁴ http://www.pta.gov.pk/index.php?option=com_content&task=view&id=1125&catid=92&Itemid=301

⁴⁵ <http://www.ptcl.com.pk/contentp.php?NID=188>

v. Regulation of Anti-Competitive Practices

Figure 18: TRE Survey Results for Regulation of Anti-Competitive Practices (2006 & 2008)



While the perception for regulation of anti-competitive practices has gone up for the mobile and fixed sectors, the score for all three sectors are below 3 and cannot be considered as good performance. Of the seven dimensions, this receives the lowest scores.

There is competition in most of the services offered by the mobile, fixed and broadband sectors as shown by Table 7.

Service	Competition
Local services	Full competition
Domestic fixed long dist	Full competition
Inter-national fixed long dist	Full competition
Wireless local loop	Full competition
Data	Full competition
DSL	Full competition
Cable modem	n/a
VSAT	Full competition
Leased lines	Full competition
Fixed Wireless Broad-band	Full competition
Mobile	Full competition
Paging	n/a
Cable TV	Full competition
Fixed sat	n/a
Mobile sat	n/a
GMPCS	Full competition
IMT 2000	n/a
Internet services	Full competition
Inter-national gateways	Full competition

The level of competition is partly dependent on the concentration in the market which is measured by looking at the market shares of the market player. Here below are market shares of the service providers in the mobile and fixed sectors.

⁴⁶ <http://www.itu.int/ITU-D/icteye/DisplayCountry.aspx?countryId=182>

Figure 19: Market share in Mobile Sector - 2008

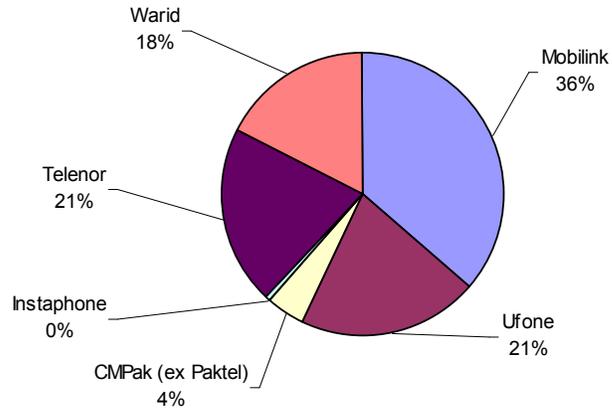


Figure 20: Market Share in Fixed Local Loop – 2008

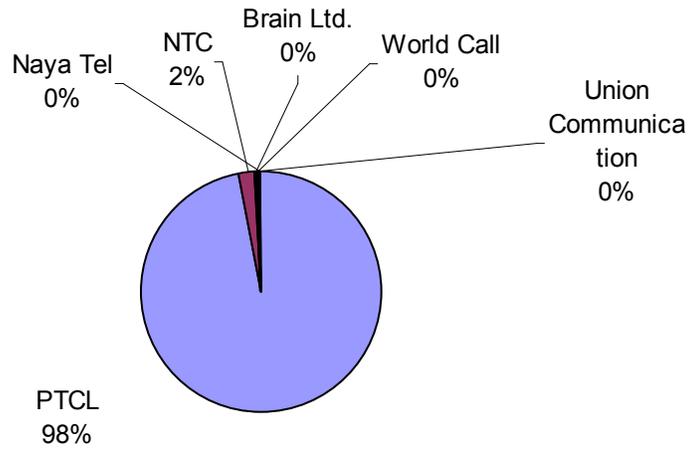
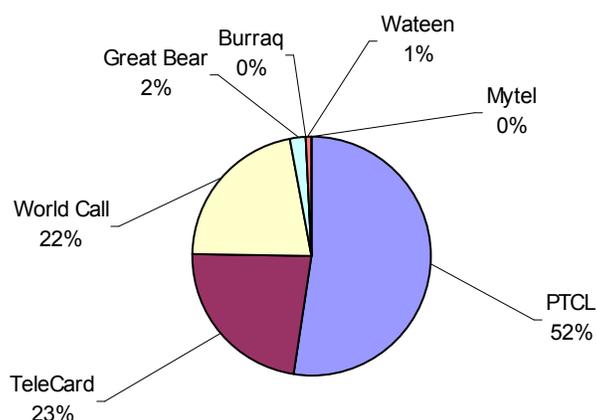
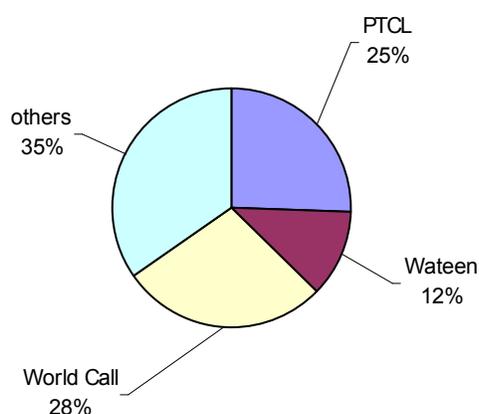


Figure 21: Market share in Wireless Local Loop - 2008**Figure 22: Market share in Broadband - March 2008**

The Herfindahl-Hirschman Index (HHI) is an index that measures market concentration. The higher the HHI index, the less competitive the market is. In a highly competitive market, there may not be a single company enjoying dominant position therefore the chances of abusing dominant position are low. As of June 2008, the HHI for the mobile telecommunications market is 2518, which by international standards reflect a highly concentrated market.⁴⁷ In the fixed sector the HHI for FLL is 9608 which represent a monopolistic market and in WLL it is 3722 which again is a symbol of a highly concentrated market. The HHI for the broadband market, if measure for the top three companies (since other companies market shares are not know), is 1553, which represents a moderately concentrated market.

To strengthen the competition law regime, Pakistan promulgated the Competition Ordinance, in October 2007, which prohibits anti-competitive practices and established Competition

⁴⁷ According to US Merger Guidelines, an HHI of less than 1000 represents an unconcentrated market, an HHI of 1000 but below 1800 represents moderately concentrated market, and an HHI of over 1800 represents highly concentrated market.

Commission of Pakistan (CCP). The CCP since its birth has taken actions against Mobilink GSM, dominant player in the mobile telephony market, for tying its BlackBerry handset with internet services, and PTCL, dominant market player in the fixed telephony market, for engaging in deceptive marketing practices.⁴⁸

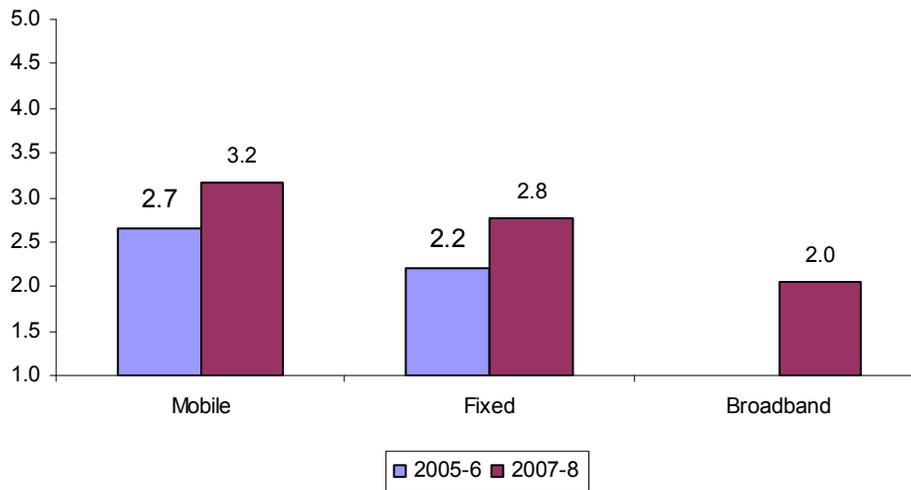
In the broadband market there are a number of complaints from the ISPAK against the dominant PTCL for engaging in anti-competitive activities. ISPAK has filed a case before the PTA for the removal of anti-competitive clauses, listed below, from DSL Interconnect Agreement between PTCL and ISPs.

- ISPs are prohibited to procure IP bandwidth and leased lines for DSL from any other company than PTCL;
- Blocking of value added services like video conferencing, VPNs, etc.
- No third party interconnects are allowed in PTCL co-locations

The matter is still pending with the PTA. It is hoped that with the enactment of Competition Law and the establishment of CCP, Pakistan will score better in anti-competitive practices parameter, in the future TRE survey.

vi. Universal Service Obligation

Figure 23: TRE Survey Results for Universal Service Obligation (2006 & 2008)



The perception regarding universal service obligation has improved by 0.5 both for the mobile and fixed sectors since last survey. This is significant improvement, which is primarily because the Universal Service Fund Company has become operative since May 2007.⁴⁹

Section 4(d) of the 1996 Act requires of the Authority to “promote the availability of a wide range of high quality, efficient, cost effective and competitive telecommunication services throughout Pakistan.” Section 3 of the De-regulation Policy of 2003 stipulates its objectives as follows:

⁴⁸ Millions of fixed line subscribers have requested PTCL to opt out of its Pakistan Package, that give the subscribers 5000 minutes of talk time across nation-wide calling for PKR 200.

⁴⁹ <http://telecompk.net/2008/10/02/interview-with-usf-ceo-mr-parvez-iftikhar-part-1/>

- a. Increase service choice for customers of telecommunication services at competitive and affordable rates;
- b. Promote infrastructure development, especially infrastructure that will increase teledensity and the spread of telecommunication services in all market segments (including voice, data and cellular etc);
- c. . . .
- d. . . .
- e. Accelerate expansion of telecommunication infrastructure to extend telecommunication services to un-served and under-served areas.

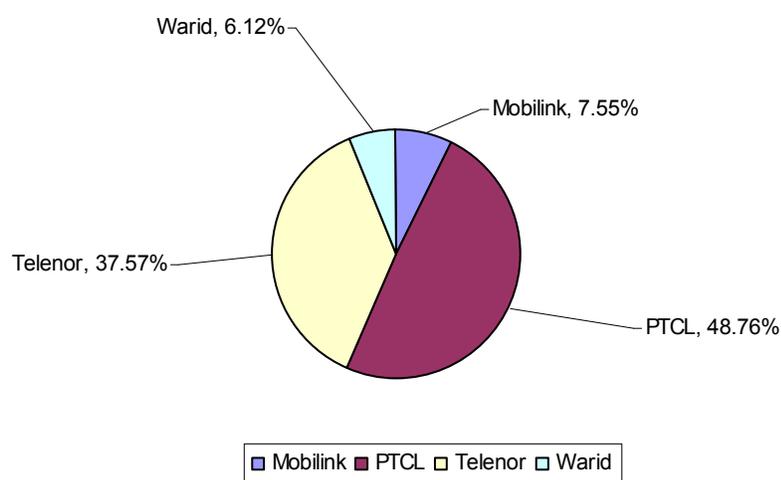
Paragraph 5.9 of De-regulation Policy of 2003 and paragraph 8 of the Mobile Cellular Policy of 2004 provide that the USF Charge will be limited to a maximum of 1.5% of gross revenue minus inter-operator and related PTA / FAB mandated payments as determined by the Government. Section 33A of the Pakistan Re-organization Act of 1996 requires PTCL to contribute to the USF Fund as well. Thus, all companies which got Local Loop (“LL”) Wireless Local Loop (“WLL”), Long Distance and International (“LDI”) or Telecommunication Infrastructure Provider (“TIP”) Licence was issued after adoption of the Deregulation Policy (2003), and persons whose mobile cellular licence was issued or renewed after adoption of the Mobile Cellular Policy (2004), have an obligation to contribute 1.5% of annual gross revenues to the Universal Service Fund, less inter-operator fees and related payments mandated by the PTA or Frequency Allocation Board (“FAB”). Only those who contribute to the USF Fund are eligible to receive a subsidy from the USF Fund.

The Ministry of Information and Technology (MoIT) issued the Universal Service Fund Policy in 2005. In terms of the Policy, the primary goal is to “to make available and affordable voice telephony and data services suitable for Internet access, to progressively greater proportions of the Pakistan population at their home locations.” The USF will be administered by an independent not-for-profit company, Universal Service Fund Company (USFCo), with a Board of Directors, comprising nine directors, representing government, consumers and the industry. The aim of the USF is to promote development of telecommunication services in un-served and under-served areas throughout the length and breadth of the country, to make available affordable voice telephony and basic data services to progressively greater proportions of the country’s population at their home locations.”⁵⁰ As of September 30, 2008, the USFCo has granted PKR 1177 million in subsidies to the following four companies.

⁵⁰ <http://www.usf.org.pk/index.asp>

Table 8: USF Subsidy Granted as of 30 September 2008 (Rs millions) ⁵¹				
Bidder/Area	Mobilink GSM	PTCL	Telenor	Warid
Malakand	-	-	310	-
Sukkur	112	-	-	-
DG Khan	-	-	-	91
Pishin	-	175	-	-
Mansehra	-	300	-	-
Dadu	-	250	-	-
Bahawalpur	-	-	248	-
Total Subsidy Received	112	725	248	91

Figure 24: Percentage of Total USF Subsidy Won by the Bidders as of September 30, 2008⁵²



a. Fixed Sector

PTCL won contracts to provide telecom services in the rural districts of Pishin, Dadu, and Mansehra and bags a majority of subsidy (48.76 %) granted by the USFCo as of September 08. This may have a bearing for the higher TRE score of the USO parameter for the fixed sector compared to the last survey's score.

b. Mobile sector

In October 2007, the USFCo signed a Pilot project Contract with Telenor to provide telecom related services in Malakand Division. In short span of three months, the USFCo signed another contract in January 2008 with Mobilink GSM to provide services to the un-served villages of Sukkur division. And then in February 2008, it entered into contract with Warid Telecom to provide telephony and data services to the mass population in un-served areas of Dera Ghazi Khan division. Telenor won another

⁵¹ <http://www.usf.org.pk/projects.asp> last visited on 15 January 2009.

⁵² <http://www.usf.org.pk/projects.asp>

contract to provide services in the district of Bahawalpur.⁵³ Grant of the subsidies to the mobile service providers have helped improve the TRE Score for the USO in mobile sector.

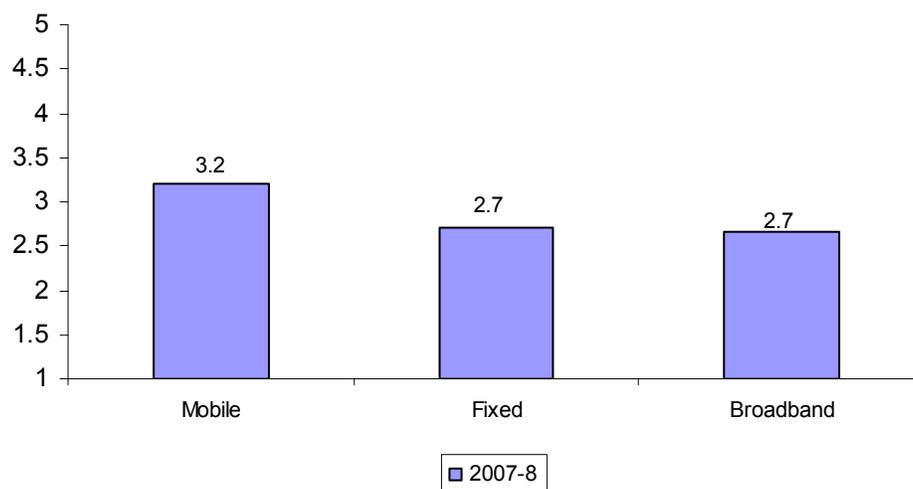
c. Broadband Sector

Universal Fund Service (USF) of Pakistan has planned to lay out optic fiber cable in every district of Pakistan that will enable rolling out of all kinds of telecom services (telephony, broadband, tele-centers, telemedicine etc.) in remotest parts of the country. A pilot project is started in Faisalabad connecting schools, libraries and dispensaries.⁵⁴ The first major project will be launched in the province of Sindh and at the conclusion of this project, Sindh will have no district without optic fiber. This project will be closely followed by similar projects in Baluchistan and NWFP.⁵⁵ The USF projects for broadband are still their early stages, and were launched after the survey was conducted; therefore, the TRE score for broadband is rather low.

However, with the proper implementation of the USF, whereby the cost of providing telecom services is subsidized, a large portion of Pakistan's population living in rural area now hope to have access to affordable telecom/broadband services in their villages.

vii. Quality of Service

Figure 25: TRE Survey Results for Quality of Service (2006 & 2008)



Quality of service (QoS), as defined in the International Telecommunication Union ((ITU) Technical recommendation E.800, is “the collective effect of service performances, which determine the degree of satisfaction of a user of the service.”⁵⁶ The quality of service parameter is being surveyed for the first time. Mobile sector has fared better than fixed and broadband sectors.

⁵³ <http://www.usf.org.pk/projects.asp>

⁵⁴ http://www.pta.gov.pk/index.php?option=com_content&task=view&id=1194&Itemid=301

⁵⁵ http://www.dailytimes.com.pk/default.asp?page=2008%5C09%5C10%5Cstory_10-9-2008_pg5_21

⁵⁶ See ITU-T Recommendation E.800, *Terms and definitions related to quality of service and network performance including dependability*, at <http://www.itu.int/rec/T-REC-E.800>.

Pakistan Telecom Authority seeks to ensure “that all service providers provide efficient, trouble free and affordable services to their subscribers.”⁵⁷ Random quality surveys/inspections are conducted by the PTA in all parts of the country to check the QoS of all service providers, including fix line, cellular, WLL, card payphones and internet services providers. PTA follows the QoS standards/thresholds as recommended by the ITU.

a. Mobile Sector

The Mobile Cellular Policy of 2004 has special provisions for ensuring quality of service. Paragraph 6.3, reproduced for ease of reference below, stipulates in detail the essential parameters for ensuring mobile telephony’s QoS.

6.3 Quality of Service

The GoP intends to ensure that licensees provide a good quality of service. The following table is indicative of the QoS measures to be included as an Annex to the Mobile Cellular Licenses. The PTA will set the QoS parameters after consultation with the Licensees before final issue of the license.

Indicator	Short Term (first 3 years)	Long Term (3 years on)
Air Interface Blocking	<= 4% in busy hour	<= 2% in busy hour
Call Completion Rate	> 96%	> 98%
Call Connection Time	<= 7 seconds	<= 5 seconds
Call Quality	MOS ³ Score > 3	MOS Score > 3
Network Down-time (averaged across all sites)	< 2% in any 1 calendar month < 1% over a 1 rolling year period	< 1% over a 1 month period
Cell-site Down-time (for each site)	Not longer than 48 hours	Not longer than 24 hours

In addition to the above QoS measures a limited number of targets will be set for service covering such areas as:

- Customer service time to answer
- Time to resolve complaints
- Billing accuracy
- Provision of interconnect ports
- Repair of interconnect ports

The PTA will after due consultation prepare a set of criteria which will be attached to the License. The Mobile Cellular licensees will be required to provide regular reports to PTA on quality of service.⁵⁸

PTA regularly conducts surveys to ensure quality of service offered by mobile service providers to their customers. In November 2007, PTA conducted its fifth QoS surveys of Mobile Cellular Operators using recently procured state of the art monitoring equipment. The services of five GSM operators i.e., Ufone, Mobilink GSM, Telenor, Warid, and CMPak were checked in selected major and small cities. Service parameters including Network Accessibility, Service Accessibility, Access Delay, Voice Quality and SMS were checked with the automated monitoring tool.

⁵⁷ PTA Annual Report 2004-05, at page 14.

⁵⁸ Para 6.3, Mobile Cellular Policy 2004, available at <http://www.pta.gov.pk/media/MCP.pdf>

Table 9: QoS Survey Results by Company (Voice)⁵⁹

Company	Total Calls	Network Accessibility (%) Threshold (TH) =99.5%	Service Accessibility (%) TH=96%	Call Completion Ratio (%) TH = 96%	Avg Setup Time (sec) TH = 7 sec	Avg Mean Opinion Score (MOS) TH = 3
Mobilink GSM	2436	99.90%	96.66%	97.50%	9	2.78
Ufone	2498	99.78%	94.85%	96.73%	8.43	2.5
Telenor	2488	99.47%	96.80%	93.02%	8.79	2.9
Warid	2501	98.22%	96.60%	97.49%	8.77	3.12
CMPak	2414	99.40%	96.52%	95.59%	8.59	2.96

The QoS survey shows that despite the high subscription, the operators are able to maintain acceptable quality of service.

It may be mentioned here that in June 2003, PTA imposed a penalty of PKR 60 million on Mobilink GSM for its poor quality of service. The Authority, in 2003, also issued show cause notices to then other cellular service providers, *i.e.*, Ufone, Instaphone and Paktel for unsatisfactory services and gave them directions to improve their QoS within 30 days.⁶⁰ Since 2003, the QoS has improved.

b. Fixed Sector

To monitor the quality of service in the fixed sector, PTA has issued *Monitoring and Reconciliation of International Telephony Traffic Regulations 2008* (MRITR).⁶¹ Regulation 2 of MRITR stipulates the scope of the MRITS, which shall apply to all Long Distance International licensees for monitoring and accurate reconciliation of total traffic terminated on the network of each licensee in order to measure and record traffic, billing and quality of the licensed service.

Regulation 4(5) requires that all reconciliation system shall consist at a minimum of the following features:

- (a) Capability to monitor, measure and record traffic in real time;
- (b) Capability for complete record of billing; and
- (c) Capability to accurately measure the quality of service; and
- (d) Monitoring of grey traffic.

It is hoped that with the implementation of MRITR the quality of service in the fixed telephony will improve.

⁵⁹ PTA, Telecom Quarterly Report, December 2007 at page 1.

⁶⁰ *Mobilink fined Rs60m for poor service: Customers to get compensation* <http://www.apnic.net/mailling-lists/s-asia-it/archive/2003/06/msg00018.html>.

⁶¹ <http://www.pta.gov.pk/>; S.R.O 1189(I)/2008, the Gazette of Pakistan (Extraordinary) 10th November 2008.

c. Broadband Sector

Paragraph 7.4 of Broadband Policy of 2004, reproduced below, mandated PTA to specify parameters for ensuring QoS in the broadband sector.

7.4 Quality of Service (QoS)

7.4.1 PTA, after studying various options/solutions, will specify parameters to ensure quality of service. QoS would cover entire range of services and would aim at protecting consumers' interests. The QoS standards would be reviewed periodically and these would be available on the website after a process of consultation and keeping in view the technological changes, international standards and best practices.

QoS of Internet Service Providers (ISPs) is continuously monitored by the PTA in order to ensure quality as per the license standards. QoS Survey of ISPs is conducted based on the following five parameters:

- i. availability of service,
- ii. connection setup time,
- iii. download speed,
- iv. download time; and
- v. connection stability during busy hours.

A total of 50 marks were allocated to test and on the basis of obtained marks ISPs are categorized as Good, Average and Poor ISPs as per following criteria:⁶²

ISP Category	Criteria
Good ISPs	80 % or above marks
Average ISPs	Greater than 70 % and less than 80 % marks
Poor ISPs	Less than 70 % marks

During October and November 2008, PTA conducted QoS survey of ISP in 17 major and small cities. A comparison of the survey results for the year 2007 and 2008 is given in Table 10 below:

Zones	Good (%)		Average (%)		Poor (%)	
	2007	2008	2007	2008	2007	2008
Lahore	40	76	40	15	20	9
Karachi	63	64	31	18	4.5	18
Rawalpindi	20	19	60	19	20	62
Peshawar	7.14	43	78	36	14	21
Quetta	100	100	0	0	0	0
AJ&K	-	0	-	100	-	0

⁶² http://www.pta.gov.pk/media/qos_result_isp_2008.pdf

⁶³ Source: Id.

5. Concluding Remarks and Recommendations

The overall score of perception in 2008 has improved since the last survey in 2006. This is primarily because the results of deregulation and competition have now started to come to the fore. An important parameter to foster competition is the ease of market entry. Through an unbundled licensing regime, PTA has ensured a competition for all types of telecom services both in the fixed and mobile telephony.

One of the sought-after outcomes of competition is lower prices. The freedom to set prices has allowed the competitors to slash their margins in order to increase their subscriber-base. As a protection against abuse of dominant position by engaging in predatory pricing, the law empowered the PTA to set tariffs of the operators who achieved the status of significant market power. Pakistan now claims to have the lowest mobile tariffs in the world.⁶⁴ Mobile subscriber-base has increased manifold to 88 million in few years. Prepaid cards costing less than US \$0.50 per month, and post-paid available at US\$ 0.2 per minute mean that owning a cell phone is no longer beyond the reach of the masses.

Another important step to promote competition, and first in the region, taken by the PTA to facilitate competition is the implementation of Mobile Number Portability (MNP), which became effective as of March 2007. With MNP in place, cell phone users can keep their phone numbers even after their six months of their prepaid card's expiry and can switch to other service providers without changing the number.⁶⁵ All these steps to further competition in the sector have led to increased foreign direct investment, and generated employment in the country.

~~Further more, wThe major challenge that lies ahead for the government is to bridge the rural-urban and digital divide. Seventy per cent of Pakistan's total population resides in rural areas, where the fixed access paths are as little less than 2%.~~⁶⁶ With the Universal Service Fund Company becoming operative and contracting out with operators to spread the network in rural areas, it is hoped that the rural-urban divide will be minimized in the times to come.

In August 2007, PTCL launched IPTV (Internet Protocol Television) service (Smart TV).⁶⁷ IPTV along with high-speed broadband internet and voice telephony is available on the subscribers existing telephone lines at the same time on one bill. The package bundles three services in one line, i.e., basic telephony, internet broadband and Interactive TV all on the same telephone line. There has eroded the boundaries among telephony, broadband and broadcasting, and has an impact on the future TRE Surveys. In future surveys, broadband may be categorized as a service provided under the mobile and fixed categories, rather than a stand alone category as it was done in the present TRE.

⁶⁴ Speech by Chairman, PTA. June 14, 2007.

⁶⁵ PTA, Telecom Quarterly Review, March 2007, Page 5.

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<http://www.pakistan.gov.pk/ministries/NewsInfo.jsp?MinID=7&cPath=78&div=itandtelecom&file=031006.xml&path=ministries/moit/>

⁶⁷ PTCL's IPTV Service Gets Huge Response, 8/15/08 Frontier Star (AsiaNet-Pak.) (2008 WLNR 17346013) August 15, 2008.

With competition now getting mature in most areas of telecom sector, with the exception of local loop services, and given that lowest average score for dimensions is that of regulation of anticompetitive practices, competition provisions should be strictly enforced by both the Pakistan Telecommunications Authority and the Competition Commission of Pakistan within the scope of their respective mandates. In addition, the regulator needs to focus on improving the penetration and the quality of service for broadband services, in order to transform Pakistan into an “Information Economy” after having tapped and exploited to an extent the potential of voice telephony.

Key Events in the Telecom Regulatory Environment in PAKISTAN during 2007-2008

- Pakistan Telecommunications Authority launched Anti-Mobile Theft system, which blocks the handset once it is stolen, snatched or lost, by using the IMEI – International Mobile Equipment Identity. As of January 2008, PTA has blocked 182, 861 handsets.
- Implementation of Mobile Number Portability in March 2007.
- Activation fee for mobile connection reduced from PKR 2000 to PKR 500.
- Purchase of 100% share of Paktel by China Mobile in May 2007.
- Rural Telephony Project was launched under which 400 Rabta Ghar (Telecentres) are being established.
- Deregulation of telecommunications sector of AJK and Northern Areas was finalized, and licenses were awarded to both fixed and mobile operators. For the mobile services, licenses were awarded to Mobilink GSM, Warid, Telenor, Ufone, and Zong (ex-Paktel).
- Mobilink GSM's license was renewed for another 15 years, until 2022.
- The Universal Service Fund Company was established and it gave out contracts to Telenor, Warid and Mobilink GSM for rolling out telecom services in the rural and underserved areas.
- WiMax networks and Wireless Broadband services were launched.
- Mobile telephone numbering scheme changed from 7 digits to 8 digits.