Analysis of Pakistan's Mobile Communication Sector

Sarah Shahid; MBA 2k4

PAKISTAN'S MOBILE COMMUNICATION SECTOR – ALWAYS SEEN FROM THE CONSUMER'S PERSPECTIVE NEVER FROM THE PROVIDER'S: Competitive market, more choice for customers, better service and falling prices ensuing the much appreciated consumer surplus; this is how Pakistan's booming Telecom sector is seen today. Does the statement stand true when witnessed from the service providers' binoculars?

Nust Institute of Management Sciences (NIMS)

Acknowledgements

I would like to thank my Parents, my professor Sir Haroon Rashid and my boss, Aqueel Malik. They know what all I am thanking them for and I know this dissertation would not have been possible without them. No amount of words can be enough to express my gratitude.

Executive Summary

In a span of three years the Mobile industry of Pakistan has surpassed expectations and speculations across the globe. With growth indicators matching those of developed nations and huge foreign direct investments, the Country's telecommunication sector has literally been revolutionized by wireless communication. The competitiveness amongst the players has resulted in huge consumer surpluses; mobiles thus not only connect the masses but instead connect them at rates that they can afford. Mobile phones are becoming commodities rather than the luxuries they were a couple of years ago. Economic activity in the country is getting more and more dependant on this mode of communication by each passing day. Regulators promote this growth even further by creating a favorable regulatory environment.

As lucrative as this market may seem to the user, who only sees every second person on the road with a mobile phone, the competitiveness of the sector is making survival for the operators a little difficult. This report studies the telecom sector from an operator's point of view. What may seem feasible for the subscriber is in reality unfeasible for the provider; but yet it is provided. With not even half of the addressable market penetrated as yet, considering all of Pakistan's population is a potential subscriber base, there is still room for growth. But by the time the Operators tap this untapped potential will there be any margins left worth striving for? After studying the state of the Telecom sector at present this report then goes on to analyzing what can the operators do to stabilize falling margins and to ensure higher ones in the future.

Table of Contents

Figures

Tables

1 COUNTRY HIGHLIGHTS

Pakistan Key Facts

Table 1: Economic Indicators

GDP PPP	US$438 Bil. (2006 estimates)
Per Capita PPP	US$2,600 (2006 estimates)
Real GDP Growth	6.6% (2006 estimates)
Population	165 Mil. (2007 estimates)
Median Age	21 years (2007 estimates)
Households	24 Mil. (2007 estimates)

Macroeconomic Environment

- Population of 160 million makes it among the 10 most populated countries in the world.
- GDP Growth heavily dependant on agriculture & manufacturing, which are undergoing structural reforms.
- Foreign exchange reserves of US$ 13bn
- GDP growth of 8.0% IN 2005
- Pakistan's "guided democracy" continues and relations between Pakistan and Indian have improved.

Mobile Telecommunications

- Mobile market comprises of six operators
- Market is characterized by heavy & intensive price war
- Mobile penetration rate currently at 43.6% vs. 3.2% for fixed line.
- Milicom sold Paktel to China Mobile for US$ 460mn, and Instafone to local investor.
- Telenor is moving to number 2 position.
- Estimated average mobile spend as percentage of GDP is 1.5%

Mobile Market Size/Penetration

Revisiting speculations made only three years back, it can be safely stated that Pakistan's Telecom sector has by far crossed all expectations. A Telecom revolution in the true sense of the word has taken place. From 8.30% in 2005, mobile penetration in the country has soared and stands at 43.60% as of September 2007.

Figure 1: Cellular Subscriber Base

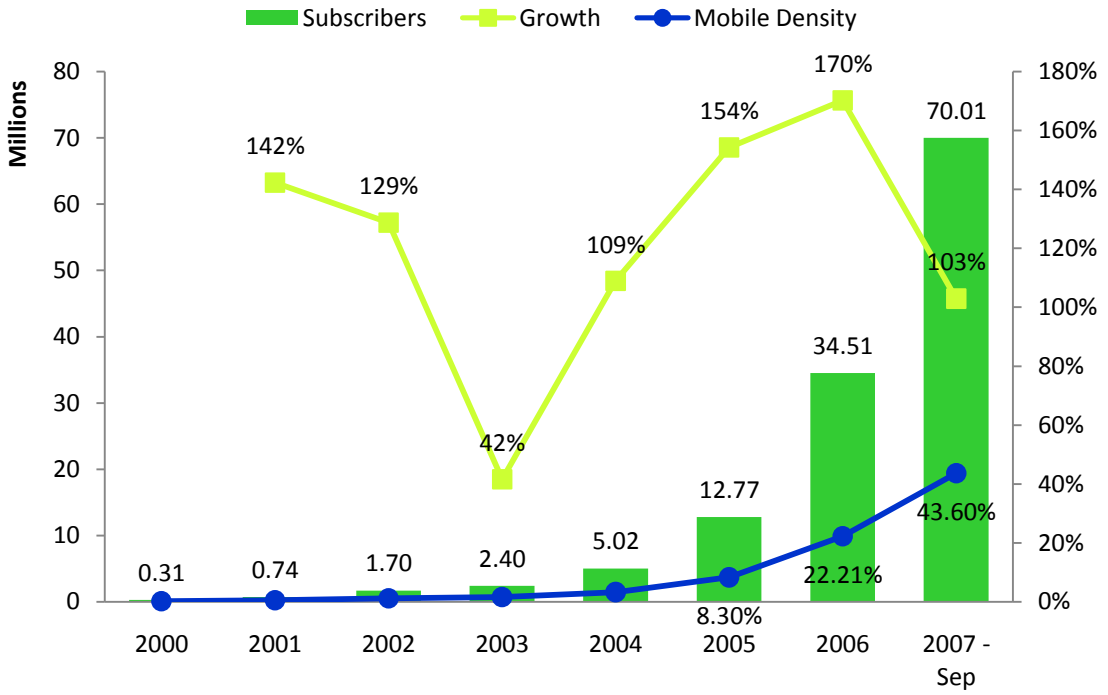


Table 2: Subscriber Data

Figures '000

	Mobilink	Ufone	Telenor	Warid	Paktel	Instsphone	Total	Growth	Mobile Density
2000	114				80	112	306		0.22%
2001	309	117			97	220	743	142%	0.52%
2002	800	350			219	330	1,699	129%	1.16%
2003	1,115	550			319	420	2,404	42%	1.61%
2004	3,216	801			470	536	5,023	109%	3.29%
2005	7,469	2,579	836	509	924	454	12,771	154%	8.30%
2006	17,206	7,487	3,574	4,863	1,041	337	34,507	170%	22.21%
2007 – Sep	28,572	15,421	12,578	11,867	1,233	337	70,008	103%	43.60%

Source: PTA Telecom Indicators

2 MOBILE NETWORK OPERATORS

Table 3: Mobile Network Operators

Mobile operator	Brand name	Majority owner	Launched	Market share
Pakistan Mobile Company Limited (PMCL)	Mobilink	Orascom	1994	41%
Pakistan Telecom Mobile Limited (PTML)	Ufone	Pakistan state, Etisalat	2001	22%
Telenor Pakistan Limited	Telenor	Telenor Mobile	Mar-05	18%
Warid Telecom Limited	Warid	Al-Warid group	May-05	17%
Paktel Limited/CMPak	Paktel	China Mobile	1990	2%
Pakcom Limited	Instaphone	Sanbao	1990	0.5%

Mobilink

At the top is Mobilink, the Pakistani unit of Egypt-based telecom company Orascom. It has been operating in Pakistan since 1994. Pakistan Mobile Communications (Pvt.) Ltd ("Mobilink") was awarded a license in July 1992, to provide GSM telecommunications services in Pakistan. Mobilink operates a GSM network in Pakistan and provides a range of prepaid and postpaid voice, data and multimedia telecommunication services. In April 2001, when OTH took over management control of the company the market share was only 40%, but as of July 2007; Mobilink served over 26.5 million subscribers, representing a market share of approximately 41.9% of total mobile subscribers in Pakistan.

- 100% owned by OTH, OTH bought minorities out in June 2007.
- Number one player with market share of 41.9%
- 62% population coverage and 95% urban population coverage by June 2007
- Expand network coverage to reach more than 5000 cities, towns & villages as well as rural areas
- Building leased lines to be completed by Q3 2007
- Introduce value-added services to differentiate Mobilink from its competitors such as launching voice portal which is the first of its kind in Pakistan & introducing GPRS in 2004 & expanding EDGE coverage

Mobilink's strategy is currently focusing on:

- Quality of subscribers & network.
- Managing costs
- New revenue streams
- Protecting On-Net advantage
- Introduced lower denominations to stimulate
- ARPU of lower income segments
- Mobilink reduced its off-net tariffs by 40% to
- align with the industry rates

Telenor

Norway's Telenor, a recent entrant with about a billion US dollar investment in Pakistan has been doing well, based on its recent earning report. It has about 16% of the market share. Telenor stock is listed in the Oslo stock market (TEL) and in US(TELNY.PK). Telenor Pakistan is 100% owned by Telenor ASA and adds on to its operations in Asia together with Thailand, Malaysia and Bangladesh.Telenor Pakistan launched its operations in March 2005 as the single largest direct European investment in Pakistan, setting precedence for further foreign investments in the telecom sector.

Strengths	Weaknesses	Opportunities	Threats
•100% ownership by parent company – willing to sustain price pressures •Popular among youth segment •Network quality and coverage	•Lower brand equity compared to Mobilink •Unsuccessful post-paid strategy •Lack of high ARPU post-paid base	•To become 2nd largest cellular operator in Pakistan •Further leverage on coverage & innovation •Rural penetration	•New market players (SingTel & China Mobile) •Improved network quality & coverage by other operators

Ufone

A wholly owned subsidiary of Pakistan Telecommunication Co. Ltd (PTCL), is now under the control of Etisalat group of UAE as a consequence of PTCL's privatization, 26% of its shares were acquired by Emirates Telecommunication Corporation (Etisalat). Being part of PTCL, the management of Ufone has also been handed over to Etisalat. During the year July 2005 to June 2006, Ufone continued on the path to success. The Company further expanded its coverage and has added new cities and highways. Ufone has network coverage in more than 750 cities, towns and across all major highways of the country. It has 22% of subscriber share and added the most lines (2.4 million) from 2006-07. For those in Pakistan it is the one company where they can easily invest locally.

Strengths	Weaknesses	Opportunities	Threats
•Local market experience (landline & cellular) •Etisalat experience (deep pockets)	•Passive approach to maintain market share •Vague product / target market philosophy •Weak brand communication strategy •Human Resources	•Being a subsidiary of PTCL; it can utilize their infrastructure for broadband and other services •Mobile / fixed convergence space	•Easy prey for all operators due to weak strategies & still substantial subscriber base.

Warid

Owned by the Abu Dhabi group of the United Arab Emirates and sister of Wateen group is number 3 with 17% market of subscribers. Recently it sold 30% share to SingTel. Singapore Telecommunications (SingTel) Group, one of the largest integrated communications service providers in the Asia Pacific region with core business operations in Singapore and Australia.

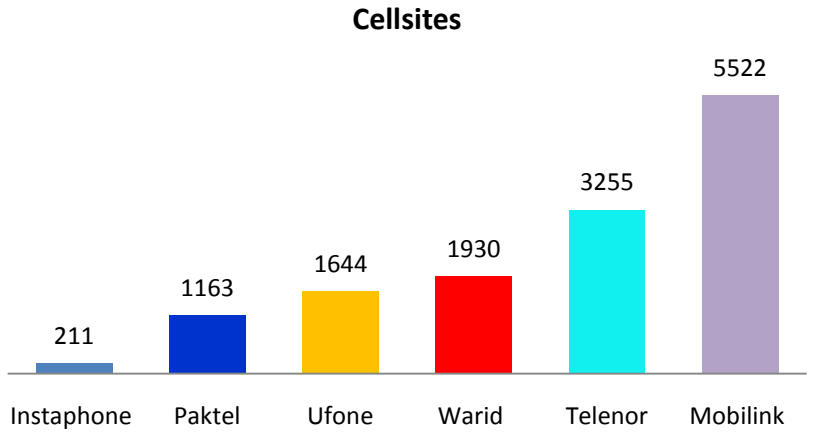
Strengths	Weaknesses	Opportunities	Threats
•Complementary business almost ready(WiMAX) •Good post-paid base	•High dormant subscriber base •Slow network rollout due to lack of finances •Management problems	•Leverage on SingTel's experience especially for data & VAS services •Improve network quality & coverage	•Aggressive price cuts making business unprofitable / unsustainable •Re-launch of Paktel with low prices challenging them as the price leader

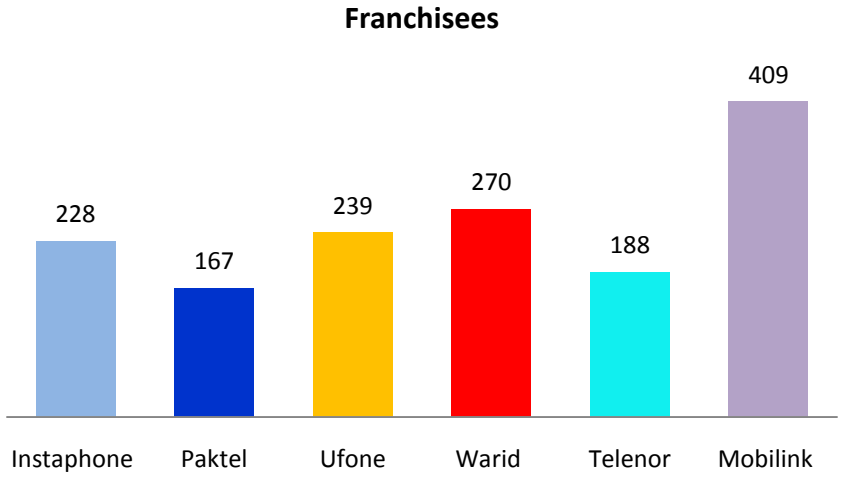
CMPak

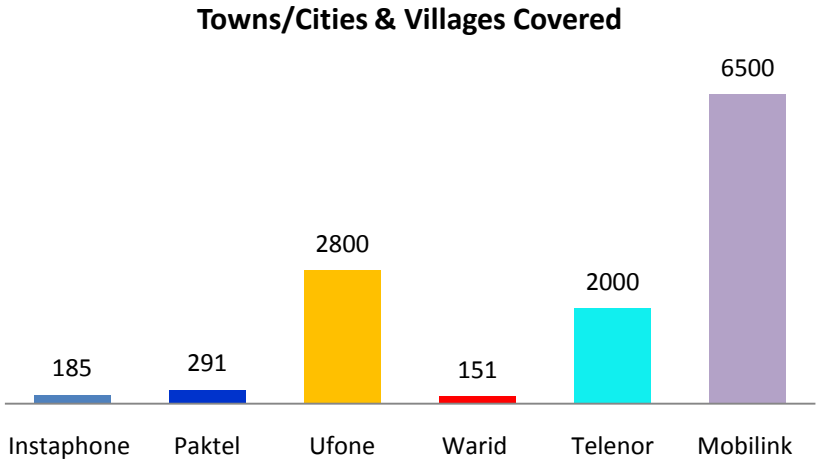
Formerly known as Paktel, is the latest target of foreign acquisition. After it got acquired by China Mobile it is in the process of rebranding. CMPak has 2% of market share. According to China Mobile chairman Wang Jianzhou, the company plans to spend USD400 million to expand its network in Pakistan. China Mobile entered the Pakistan mobile market in the mid of 2007 when it acquired an 89% stake in Paktel for USD284 million, its first acquisition beyond China and Hong Kong. China Mobile hopes to gain experience from the venture that it could apply to further overseas expansion in the future.

Strengths	Weaknesses	Opportunities	Threats
•Strong financial backing of China Mobile	•Legacy of inferior brand and poor network coverage & quality •Late entry (low subscriber base: almost starting from zero)	•Grab market share with lower prices •Rural penetration trough lower prices and cheaper Handsets like in China	•Very low subscriber base resulting in unprofitable business for next few years •Established brands already present on both high & low end – little room for unique positioning

Nation Wide Telecom Coverage







3 REGULATORY ENVIRONMENT

Brief Overview

- Pakistan Telecommunication Authority (PTA) responsible for
  - Ensuring that licences requirements in terms of Quality of service and coverage are fulfilled
  - Enforcing interconnect agreements
  - Protecting consumer rights
  - Providing a level playing field to all telecom service providers backed by a predictable policy regime

- PTA committed to
  - Liberalization and deregulation of the industry
  - Encouraging new technologies to ensure that the telecom services in Pakistan are at par with international markets (Wimax)
  - Rational and industry friendly policies following the best international practices (Calling Party Pays etc)

- Evaluating the viability of 3G and MVNO in Pakistan
  - Recently issued policy guidelines for MVNOs

- Launched MNP March-07 in conformity with the Mobile Cellular Policy
  - Impact insignificant as only 17K customers have used the service in two months of launch

- PTA awarded the Government Leadership Award by the GSMA in 2006 due to excellent performance

Industry Development Initiatives

Universal Service Fund (GSM)

Universal Service Fund, commonly known as USF, is a tax on telecommunication service which is used to fund and subsidize telecommunication infrastructure for remote and rural areas. USF is a controversial regulatory tool. It has been around since 1997 in USA. The goals of Universal Service, as mandated by the Telecommunications Act of 1996, are:

- To promote the availability of quality services at just, reasonable, and affordable rates
- To increase access to advanced telecommunications services throughout the Nation

- To advance the availability of such services to all consumers, including those in low income, rural, insular, and high cost areas at rates that are reasonably comparable to those charged in urban areas

In Pakistan USF was also setup with similar intentions of reducing the digital divide and to advance ICT. The government is firmly poised to spend millions of dollars from Universal Service Fund (USF) to add up about 1000 new Basic Transmission Stations (BTSs) and cell sites in remote areas which were not commercially attractive for the existing players. Part of the conditions for licence approvals for new companies such as Telenor and Warid included that these providers will invest in rural areas in addition to the more lucrative urban cities.

USF is a way to provide telecom services to under-served areas based on the pooled funding collected from telecom services. Six geographical areas have been marked out in the divisions of **Malakand, Sukkar, Sibbi, Chaghi, DG Khan and Attock.** They have been selected due to a large part of the population in these areas still in want of telecommunication services.

Mobile Number Portability (MNP)

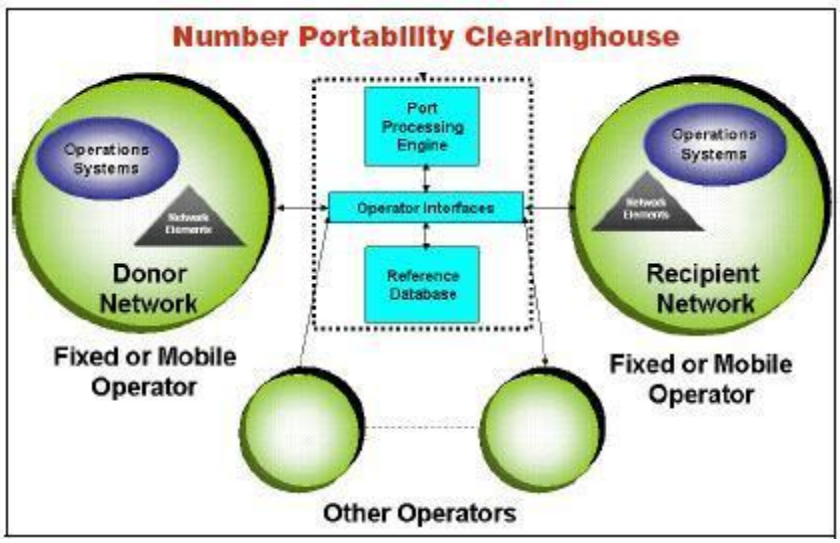
How MNP was Implemented in Pakistan (Bhatti, Guide to MNP in Pakistan, 2007)

Number portability implementation in general requires the ability to deploy number portability successfully, with minimal service disruption to existing customers in a timely fashion, thus complying with regulations. Number portability readiness planning is an important early phase activity to achieve flow-through of processes, transition to a centralized solution, implement standard interfaces to reduce costs, maintain minimal service disruption to customers, and incur minimum costs during ramp-up and service launch.

In Pakistan, an independent body - Pakistan MNP Database (PMD) - was setup by Pakistan Telecommunications Authority (PTA), with the specific purpose of managing the implementation of MNP. The PMD is set to have a 14 member dedicated staff, with the entire project costing Rs. 4-5 billion (US$66 million – US$82 million) with US$10 million –US$12 million contribution from each mobile operator, reports ITP.

PMD is utilising Telcordia's Number Portability Clearinghouse solution as its centralised repository for number porting. The solution automates ordering, provisioning, notification and administration and allows service providers to rely on the same set of rules for handling port requests, so number exchanges can occur quickly and accurately.

Figure 2: Number Portability Clearinghouse Architecture



(Tahir, 2007) Mobile Number Portability service was introduced in Pakistan in March 2007. MNP facilitates the customers to switch to any service, package or operator while without changing their existing mobile number, thus providing customers with freedom of choice. MNP was part of the regulatory mandate under which mobile companies were awarded licenses to operate. The MNP implementation was a large and costly undertaking.

However, according to Pakistan Mobile Number Portability Database Company Limited (PMD), till August 2007 approximately 20,000 subscribers out of 58 million had availed the facility. According to industry experts, "The incidence of switching from one cellular company to another in Pakistan has been much lower than the world average of 3 percent".

The Unique Selling Proposition of MNP aims at increasing buyer's bargaining power, which is viewed as a potential threat by service providers. The threat of buyer's bargaining power is already high in Pakistan's Telecom Market characterized by stiff competition. MNP does provide some justification from customer services and regulatory perspectives and due to this, operators will have to struggle further to minimize service switching and to retain the customers.

From service provider's perspective MNP poses a potential threat of LOSS, especially for new entrants who are already struggling with market penetration, regulatory issues and inadequate infrastructure platform available in Pakistan.

However, very slow acceptance of MNP is providing much time to the service providers to craft their business development strategies accordingly. One of the reasons for the slow acceptance for MNP is lack of awareness. PTA so far has not been much effective to actively promote the service and it is not wise to expect the service providers to do so as "BRAND" and then the bottom line of business which is "Revenue" matters most for the market players. However, all

the operators have allocated space for information regarding MNP on their websites. Further, the process to avail this service is also not very simple. From customer to recipient operator to donor operator to verification and then till activation of MNP is much time consuming. The switching cost is also there. Companies are charging Rs50 to Rs200 for MNP activation. In comparison to this it is far easier to purchase a new connection with free minutes, SMS etc in no time and informing all contacts about the new number through SMS.

From service perspective, customers have complained about the inability to receive incoming calls. Customers have also reported that PTCL callers have faced difficulty calling to their mobile numbers. The process can be slow and discouraging. In some cases it even took a month to get the MNP service activated.

PTA may have checked off another task on their "To Do" list but MNP in Pakistan cannot be described as a success so far. Only market forces will decide the long term prospects for Mobile Number Portability.

4 LITERATURE REVIEW

REPORT: *SIM Activation Tax and Mobile Telecommunications in Pakistan*

The is a chapter from a report that was prepared by Deloitte & Touche LLP, a limited liability partnership registered in England and Wales, for the purposes of assisting the GSMA in: (i) understanding the potential impact of SIM activation taxation and withholding taxes on mobile penetration and usage and subsequently mobile growth in Pakistan; and (ii) quantifying the economic impact of the mobile industry in Pakistan.

Economic impact of mobile industry in Pakistan

In this section we outline the approach we have taken in estimating the static economic impact of the mobile industry in Pakistan. We estimate that the mobile communications industry contributed a total of around PKR 312 billion to the economy in 2006, representing over 5% of total GDP. This was a significant increase on the 2003 contribution of PKR 45 billion.

Methodology

We initially calculate the economic impact of the mobile industry between 2003 and 2006 using static analysis1. Our estimates are based on:

- Interviews and data collected from public sources including the PTA, CBR, MOIT and National Statistics Bureau;
- Interviews and data collected from four of the six mobile network operators (MNOs). These are Mobilink, Telenor, Ufone and Warid;
- Interviews and data collected from others in the mobile value chain including infrastructure providers, handset dealers, airtime wholesalers and retailers; and
- International benchmarks and studies.

We have not verified the accuracy or robustness of the information provided to us and where there have been discrepancies between data sources then we opt to use information provided to us by the MNOs.

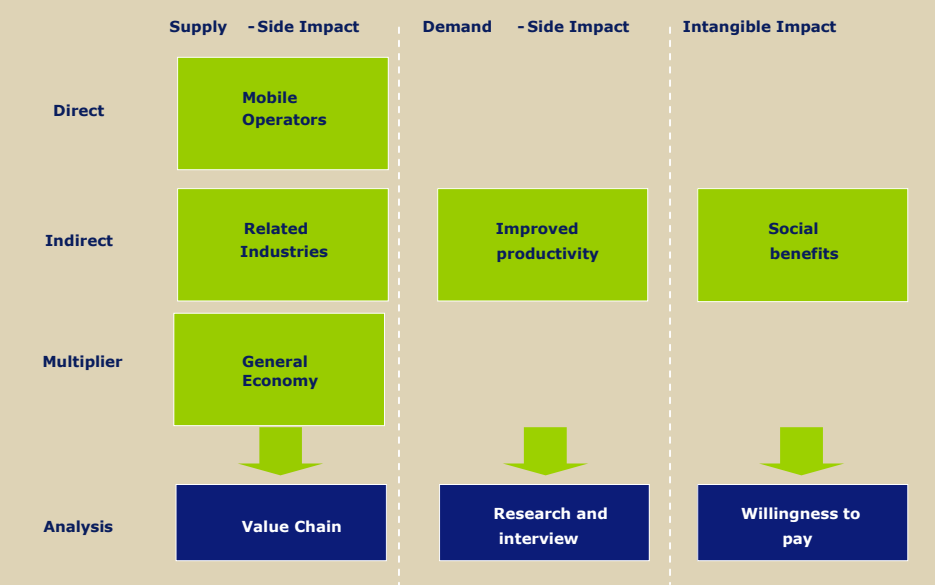
[1] Static analysis refers to the impact of mobile services for a particular period of time and does not seek to estimate the longer term impacts of economic welfare. However, static analysis is extremely useful due to the greater availability of disaggregated data relative to dynamic analysis where a greater number of assumptions are typically required.

We estimate the value of the mobile communications industry to the Pakistani economy in terms of employment and GDP, analysing both direct MNO and indirect contributions. We have defined the total economic impact as consisting of the following elements[2]:

- The direct impact from the mobile operators;
- The indirect impact from other industries related to mobile services;
- The indirect impact due to the surplus enjoyed by end users in terms of productivity improvements; and
- The indirect impact due to more qualitative social benefits enjoyed by the population.

We have structured this static analysis as illustrated by the following figure. The different impacts are summed together to give the total economic impact3.

Figure 3: Structure of analysis of economic impact on GDP and employment



Source: Deloitte

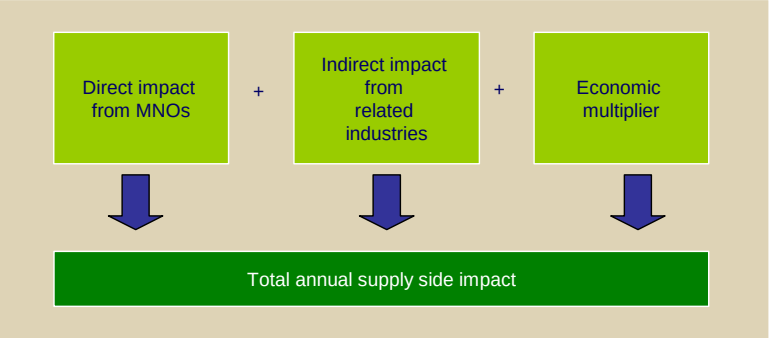
Supply side impact of mobile communications

We have estimated the value add created by the mobile communications industry. We quantify the contribution of the mobile industry to the economy, covering the industry and its adjacent sectors. This is calculated by aggregating the direct, indirect and economy wide (multiplier) effects that have occurred in each year.

[2] Consistent with the McKinsey report , "Wireless Unbound", 2006

[3] To obtain the total economic impact, it is necessary to sum together the supply side, demand side and intangible impacts. Whilst these are intended to capture different impacts of mobile telephony, there is a potential for limited double counting.

Figure 4: Structure of supply side analysis



This gives a snapshot view but does not take into account the future benefits to the economy resulting from growth. A customer's spend on mobile services flows along the value chain to the players within the industry (the operators, suppliers, distributors and others); and ultimately in part to the Government via tax revenues. Money flows between these in the industry, and the amounts retained are used to pay wages, taxes, buy inputs and pay other costs. Finally, the Government collects tax revenues from all operators within its jurisdiction. In our assessment, we focus on the supply side impact on Pakistan and ignore international impacts.

Our estimate of this impact should be regarded as conservative as we have not been able to identify data to document the secondary impact from network equipment suppliers and certain other recipients of cash from the mobile operators. We have also estimated the "leakages" from the system, i.e. what percentage of any rupee spent will remain within the national economy to be spent in the next round and use this to isolate the impact on the Pakistani economy from the total international impact of the mobile communications industry.

Value chain impact

Firstly, we analysed the value add of the mobile network operators in Pakistan.

We have determined five categories of economic value which are directly created by the MNOs in Pakistan:

- Wages and employee benefits;
- Contractor costs;
- Taxes and regulatory fees;
- Corporate social responsibility; and
- Dividends.

For each of these categories we identify the proportion of value add which relates to the domestic economy. This analysis is based upon operator management accounts which identify the final destination of monetary flows. We find that they directly contribute PKR 51 billion in 2006. The breakdown by category is provided in the figure below.

Table 4: Value add of mobile network operators (excluding multiplier effect)

Value add (Rupee millions)	2003	2004	2005	2006
Employee wages and benefits	624	1,394	2,709	4,973
Contractors	35	29	157	192
Taxes and regulatory fees	9,022	16,900	27,827	44,499
CSR	17	39	150	20
Dividends	-	1,829	937	1,450
Total	**9,698**	**20,191**	**31,779**	**51,134**

Source: Deloitte analysis based on information provided by MNOs , interviews with players in related industries and publicly available information.

Taxes and regulatory fees (including spectrum fees) make up the largest proportion in the above table, accounting for over 87% of the total in 2006. The next largest contributor is employee wages and benefits.

Corporate social responsibility (CSR) programmes received over PKR 20m in 2006, including sponsorship of events. The MNOs also commenced VSAT services and the instant roll out in AJK without any changes to subscribers. The equivalent figure for 2005 was PKR 150m representing the donations from the MNOs towards the Kashmiri earthquake fund.

We then analysed the revenue flows from the mobile operators to others in the industry, quantifying the share of revenue that translated into value add4. Using the same categories of value add used in the MNO analysis above. Based upon interviews with industry players, a review of annual reports of similar companies and similar studies, we calculate the following percentages of revenue as indirect value add.

Table 5: Indirect value add margins

Source of value add	% of revenue received from MNO
Fixed telecommunications operators	56%
Network equipment suppliers	46%
Handset producers and dealers	13%
Other suppliers of capital items	46%
Suppliers of support services	79%
Airtime and payphone commission	57%

Source: Deloitte analysis based on review of company accounts, interviews and benchmarks

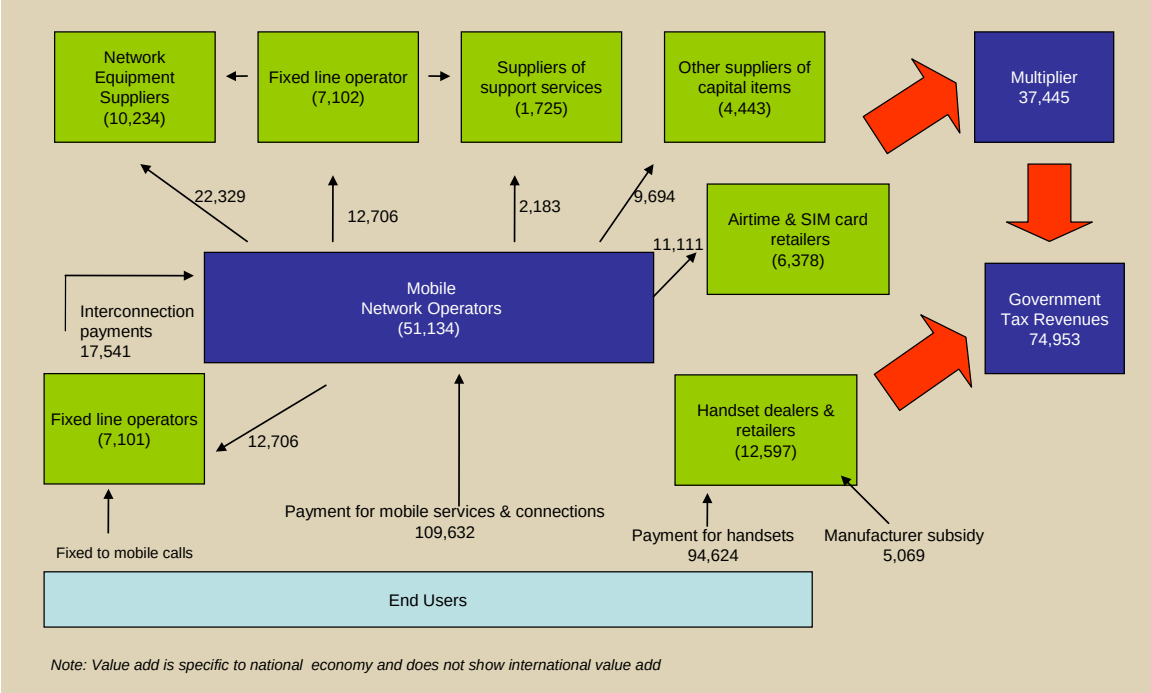
[4] Details on value add margins are contained in the assumptions appendix

Our primary source of information was interviews with operators and analysis of operator accounts. Our estimates of the flows are based on:

- Discussions with mobile operators;
- Discussions with handset dealers and equipment suppliers;
- Discussions with other stakeholders (suppliers, chamber of commerce, etc);
- Analysis of Government taxation statistics; and
- Analysis of accounts and billing information.

Following the identification of these revenue flows, we estimate the proportion of these flows that remain within the domestic economy and are translated into a positive economic benefit.
The estimates of value add include a multiplier effect on the wider-economy which is assumed to be 40% of value-add. The figure below provides revenue flows between providers and estimates of value add.

Figure 5: Mobile value chain in Pakistan in 2006 (PKR millions)



Source: Deloitte analysis based on information provided by MNOs and industry players, interviews and analysis of company accounts and industry reports

The figures next to the arrows represent the flow of money from one group to another. The figures inside the boxes represent the value retained by each group. The figures shown relate solely to domestic flows and domestic value add. The table below shows the calculation of value add.

Table 6: Calculation of value add from mobile communications in Pakistan in 2006

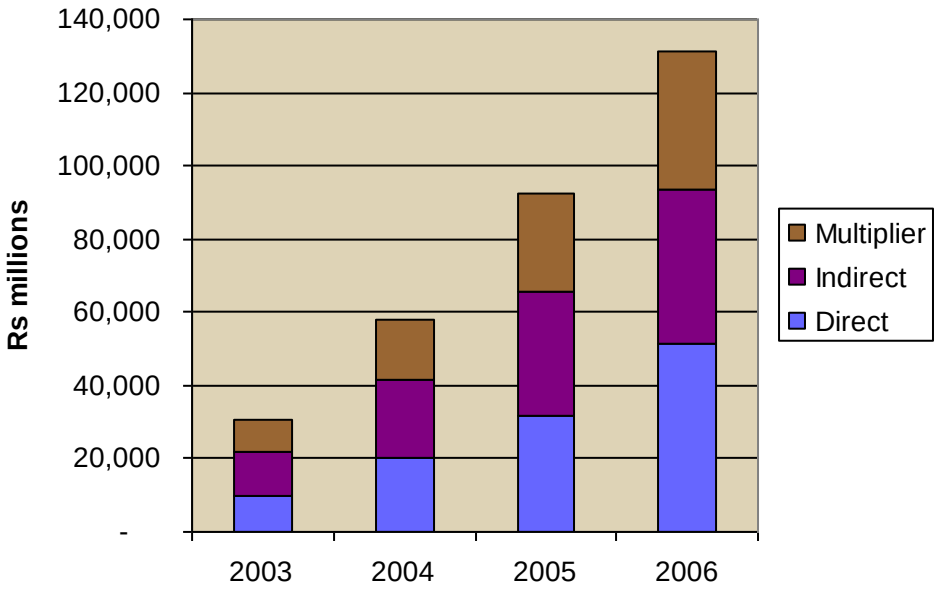
Domestic value add, PKR millions	Total revenue	Domestic revenue	Domestic cost	Domestic value add	Value add with multiplier
Mobile network operators	127,173	127,173	76,039	51,134	71,587
Fixed operator	13,516	12,706	5,605	7,102	9,942
Network equipment suppliers	89,162	22,329	12,095	10,234	14,328
Other suppliers of capital items	11,309	9,694	5,251	4,443	6,221
Handset designers and producers	99,693	99,693	87,096	12,597	17,636
Support services	2,183	2,183	459	1,725	2,415
Airtime and SIM commission	11,111	11,111	4,733	6,378	8,929
Total	**354,149**	**284,891**	**191,278**	**93,613**	**131,058**

Source: Deloitte analysis based on information provided by MNO and other industry players, interviews and analysis of company accounts and industry reports

The estimates of value add include a multiplier effect on the wider-economy which is assumed to be 40% of value-add. 69% of the revenue flows from the MNOs are estimated to remain in Pakistan, however this figure is dominated by interconnection payments and airtime and payphone commissions. It is estimated that only 20% of capital expenditure is domestic, primarily low-value non network equipment. Over 95% of support services are purchased from within Pakistan, including legal services, marketing and advertising and outsourced network maintenance.

Using the same process as above, we calculated the value-add on an annual basis from 2003.

Figure 6: Supply side value add from mobile communications 2003 to 2006



Source: Deloitte analysis, calculated as in previous tables

Our estimates suggest that value add has increased by over 300% during the four year period.

Contribution to Government revenue

Calculating tax revenues

Tax revenues to the Government are raised through taxes specific to mobile services, corporation tax, income tax and regulatory fees. Tax revenues are collected from the Government from all components in the value chain, although we assume a degree of leakage from the informal sector.5

We have collected information on revenues for the following types of taxes:

- Economy wide taxes: Value added (sales) taxes, corporate taxes and income tax paid by employees; and
- Mobile taxes: Licence and spectrum fees, import duties, and other mobile specific taxes.

We calculate the tax revenues directly from the mobile operators and also from other entities in the value chain.

Table 7: Tax revenues in Pakistan from mobile operators, PKR Millions

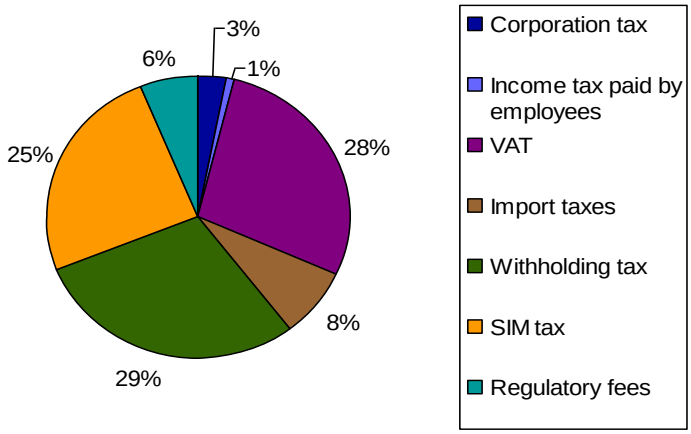
Taxes from mobile network operators	2003	2004	2005	2006
Corporation tax	409	1,854	249	1,417
Income tax paid by employees	25	74	157	354
Sales and other consumer taxes	7,065	12,668	21,131	36,641
Import taxes	913	1,327	3,087	3,420
Licence, spectrum and USO fees	610	977	2,203	2,667
Total taxes and fees	**9,022**	**16,900**	**27,827**	**44,499**
Tax as a percentage of revenue	30%	33%	25%	35%

Source: Deloitte analysis based on operator data

The largest proportion of tax revenue is raised through consumer taxes (mobile specific and sales taxes) which accounted for 82% of tax paid in 2006. Of these, the SIM activation tax makes up around 30% of total tax paid in each of the four years. The breakdown for 2006 is illustrated in the following figure.

[5] We make assumptions on the percentage of money flows that are subject to the national tax regime. For example, we assume legitimate registered businesses pay sales, import, employee and corporate taxes whilst we assume only a small proportion of streetside airtime sellers and handset dealers pay taxes. Therefore we do not assume that all flows are subject to taxation.

Figure 7: Breakdown of 2006 tax revenues from mobile operators by source



Source: Deloitte analysis based on operator data

In addition to the direct tax revenue received from mobile operators, it is necessary to consider the tax revenue received from others in the value chain. We have considered import, sales, corporation and employee income taxes in our calculations below.

Table 8: Total tax revenues from the mobile value chain in 2006

Tax Revenue, PKR millions	Tax revenue	Tax revenue with multiplier
Mobile network operators	44,499	62,298
Fixed operator	2,297	3,215
Network equipment suppliers	2,382	3,334
Other suppliers of capital items	1,034	1,448
Handset dealers	2,661	3,725
Support services	233	326
Airtime and SIM commission	433	607
Total	**53,538**	**74,953**

Source: Deloitte analysis based on Deloitte tax data, analysis of company accounts and interviews

Note this represents tax revenues directly created by revenue flows from the MNOs, or from consumers for mobile handsets, and not total tax revenues from the sector

In relation to handset dealers, mobile handsets are exempt from import and sales taxes and therefore the handset dealers are estimated to pay less than 3% of total revenues in taxes6. The taxes paid by the fixed operator represents the proportion of tax paid for terminating MNO traffic and for providing

[6] Although handsets are exempted from sales tax and import duties, the handset dealerships are required to pay employee and corporation taxes.

limited leased line services and not total taxes paid7. Similarly, the taxes paid by the infrastructure providers represent only a proportion of total taxes paid by these entities.

Impact on employment numbers

Mobile services contribute to employment via several avenues:

- Direct employment of the industry and related industries;
- Support employment created by outsourced work and taxes that the government subsequently spends on employment generating activities; and
- Induced employment resulting from the above employees and beneficiaries spending their earnings, and creating more employment.

The first impact is calculated directly by collecting data from MNOs and, for the related industries, dividing the proportion of revenue spent on wages by the average wage rate in each sector. Typically, support and induced employment is estimated using a multiplier and other studies have used a ratio of 1.1 to 1.7 for induced employment. The use of such multipliers can often be criticised for the lack of consideration to the economic basis of the industry and country under consideration. Following a review of the available international evidence, we have chosen to apply a multiplier of 1.4 on all value add (including employment), representing our view of the relative openness of the Pakistani economy. For example, many technological capital goods are imported from overseas but a lot of skilled and unskilled labour is provided domestically and there is a relatively low level of ex-patriot employment.

Table 9: Contribution to employment from the mobile value chain

Employment Impact	Number of employees	Number of employees including multiplier
Mobile network operators	8,779	8,779
Fixed operator	11,201	15,681
Network equipment suppliers	4,109	5,753
Other suppliers of capital items	1,625	2,275
Handset dealers	3,933	5,507
Support service providers	1,700	2,379
Airtime, SIM card and handset retailers	123,111	172,356
Total	**154,459**	**212,731**

Source: Operator data, interviews and Deloitte analysis on average wage rates. (Note this is employment directly created by revenue flows from the MNOs and does not represent total employment in the sector).

[7] This was calculated as total tax paid by the fixed operator (as reported in the audited financial statements) multiplied by the share of the fixed operator revenues that come from the MNOs as payment for terminating mobile originating calls and providing leased lines on the national backbone.

The largest category of employment relates to retailers who sell airtime, SIMs and handsets. Employment levels for this category of employee were unclear and were estimated by a number of different approaches, utilising information provided during interviews with MNOs, handset dealers and franchisees, which provided similar level of overall results.

Mobile related employment from the fixed line operator provides the second largest employment category and is greater than total MNO employment8. Employment from network equipment suppliers has increased as the number of MNOs has increased. There are 5 major network equipment suppliers with substantial operations in Pakistan.

Demand-side impact: Increases in productivity

There are numerous ways in which mobile services can improve productivity, particularly in developing countries where mobile services have "leap-frogged" fixed line services and are the provider of universal service. The following important effects have been identified in the research[9]:

- Improving information flows: mobile services allow certain occupations (such as commodities and agriculture, both prominent in developing countries) to "cut out the middle-man" as traders can obtain information on prices, quality, quantities directly. This improves the incomes of producers, and helps reduce wastage;
- Reducing travel time and costs: similarly, mobile services allow workers to trade and share information without travelling. The Vodafone paper on Africa (2006), contains analysis on Tanzania and South Africa found that 67% of users in Tanzania said that mobiles greatly reduce travel time[10];
- Improving efficiency of mobile workers: mobile services improve the efficiency of all workers in the economy. This effect will particularly be felt by workers with unpredictable schedules, for example those involved in repair and maintenance, or collection and delivery. Mobiles will give them greater accessibility and better knowledge of demand; and
- Improving job search: mobile services improve the chances of the unemployed finding employment through enabling people to call for opportunities rather than relying on word of mouth. Further to this, owning a mobile phone makes workers more employable as they are contactable while away.

8 Fixed network operator employment is estimated by dividing the payments from the MNOs to the fixed network operator by the revenue per employee of the fixed operator. Revenue per employee calculated directly from the audited financial statements

9 See, for example, "Africa: The Impact of Mobile Phones", Vodafone Policy Paper Series, No.3, March 2005.

10 "Africa: The Impact of Mobile Phones", Vodafone Policy Paper Series, No.3, March 2005.

During our interviews with government, regulator and operators, a number of specific areas where mobile productivity has been improved were noted. These included:

- Substantially reducing travel times and costs: particularly in rural areas where previously traders would have needed to travel to the urban areas to check for demand and agree prices, this business is now conducted on the telephone. Traders are able to ensure demand exists for their products before setting out on a journey;
- Creating market efficiency: particularly in the agriculture sector, workers are now quickly notified about changes in demand or prices so that they can amend their growing and harvest plans accordingly;
- Encouraging entrepreneurialism: mobile has encouraged the growth of small business and has increased its efficiency. For example, by being constantly reachable on their mobiles, many women in Pakistan have been able to start small businesses for the provision of beauty and hairstyle services, without the need to incur the initial costs of setting up beauty salons; and
- Mobile banking: This reduces the need to "meet in person" to conduct business. Also, telephone banking is reducing the need for people to queue in banks to check their balances.

No established economic methodology exists to estimate the GDP and employment effects of such productivity improvements across the economy. As such, we have considered available evidence from the literature in the area and conducted interviews with stakeholders (including business and government representatives) in order to provide an indication of the demand side impact of mobile communications in each of the countries. We have not been able to obtain any reports or studies that particularly focus on Pakistan and, in the time available to us, we have not been able to quantify the impact of these gains11. However, all those we questioned in government and at the regulator agreed that mobile communications had transformed the way in which business was conducted, with one individual stating that "mobile has revolutionised the way people do business".

Other surveys have typically quantified productivity improvements to be between 6% and 11%. For example, Mckinsey quantified the impact to be 10% in China, whilst the impact in the UK has been estimated to be both 6% and 11%. Based on our interviews, it may be assumed that the productivity increase in Pakistan would be at the high-end of this range as:

- Interviewees have all reported on the dramatic impact that mobile telephony has had on the Pakistan economy. These interviewees have described changes that appear greater than those documented in other reports;
- The limited fixed line roll out implies the impact of mobile should be compared to a base-line of limited connectivity rather than higher fixed line penetration rates of the UK and China;
- Higher levels of informal activity imply greater need for co-ordination between individuals since there is less formal communication at the company level; and

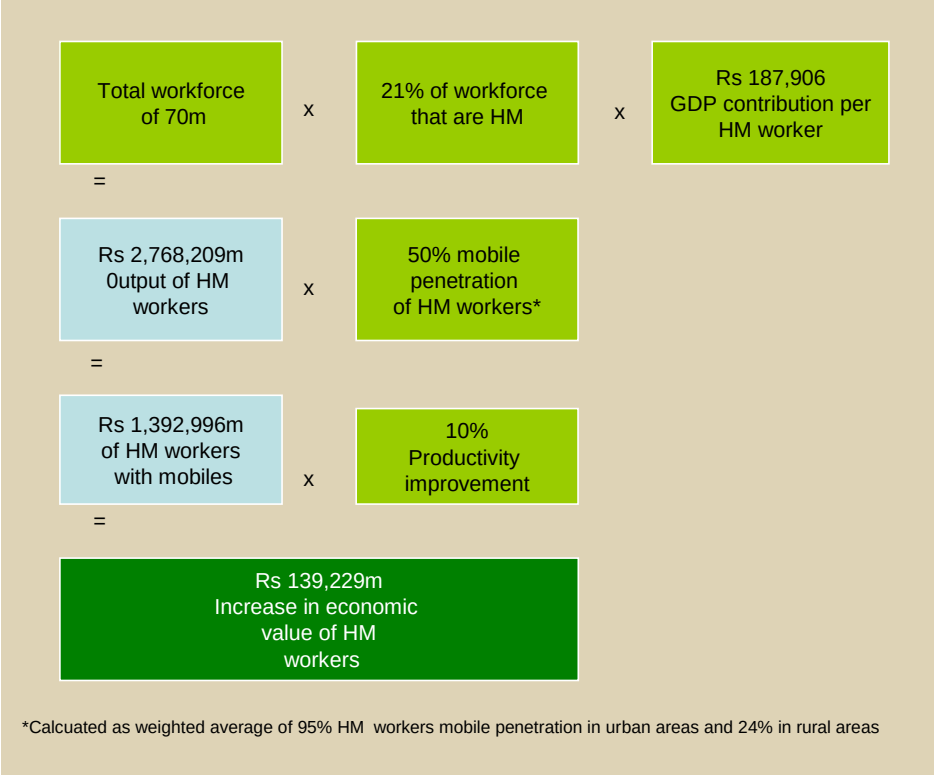
[11] Quantification would require consumer and business surveys to be undertaken

- Pakistan is more rural than the UK so the travel-time savings are likely to be greater.

We estimate the impact on the productivity improvements on the overall economy by assuming that the productivity improvement will be experienced by high mobility employees within the economy. In line with similar studies12, we define high mobility workers as those workers who undertake a moderate to high degree of travel in the course of their employment (e.g. taxi drivers, agricultural workers selling produce in town, salesmen and transport workers). We calculate the proportion of high mobility workers by reference to data from the national bureau of statistics and international labour databases. We have estimated the productivity gain of high mobility workers with access to a mobile phone by undertaking interviews to identify the impacts seen in each country and by reference to previous studies.

We assume a productivity gain of 10% has been experienced by high mobility workers who own a mobile phone. Using the economic value concept, we estimate the incremental impact on the economy was Rupee 139,299m 2006. This calculation is set out below. We have not considered the impact on low mobility workers in our analysis.

Figure 8: Economic impact in 2006 of increased productivity amongst high mobility workers

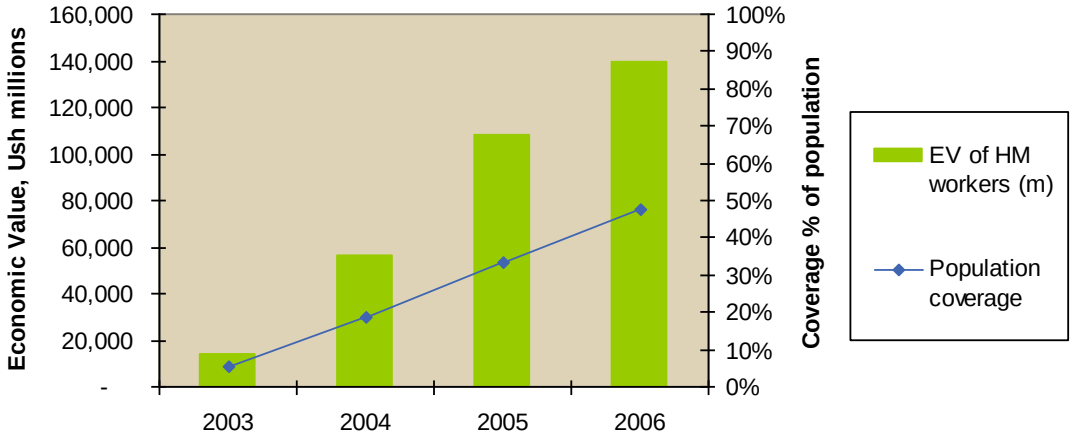


Source: Deloitte analysis based on Deloitte assumptions, interviews and information from Pakistan national statistics office

[12] For example, Wireless unbound, the surprising economic value and untapped potential of the mobile phone, Mckinsey & co, September 2006

Our analysis shows large increases in productivity between 2003 and 2006. This has been driven by mobile network roll-out which has allowed a greater proportion of the population access to mobile technology.

Figure 9: Economic value from increases in productivity, 2003 to 2006



Source: Deloitte analysis. Population coverage calculated by GSMA

Demand side impact: Intangible benefits

Finally, we seek to identify the intangible impact of the mobile industry in Pakistan. We utilise information provided to us during interviews in Pakistan and additionally we draw upon and extend findings from the Vodafone report (March 2005)13 relating to Tanzania and evidence of gains from similar studies that we have undertaken in other regions. Intangible benefits of mobile telephony identified as being relevant to Pakistan include:

- Promotion of social cohesion: through enabling contact when family members or friends who have moved away, and building trust through sharing of handsets. In addition, the study found a statistical robust relationship between mobile ownership and willingness to help others in the community;
- Delivery of "peace of mind" to parents who can keep in touch with their children;
- Extension of communications to users with low education and literacy, particularly through the use of texts;
- Extension of communications to those on low incomes: whilst individuals with low income levels are often unable to afford a handset or even the lowest value prepaid cards, through the use of formal and informal payphones they are able to enjoy the benefits of mobile communications;

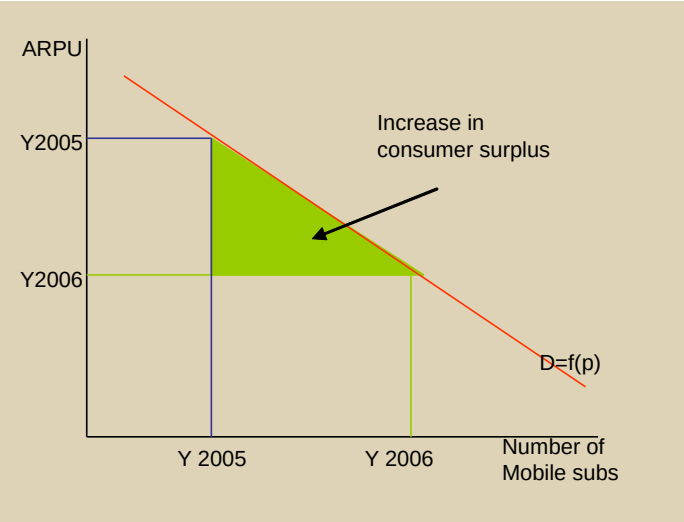
13 The specific article referenced is "Linking mobile phone ownership and use to social capital in rural South Africa and Tanzania"

- Stimulation of local content: this can be particularly useful for allowing users to learn about local services such as healthcare or education; and
- Assistance in disaster relief: mobile services allow families and friends to stay in touch in the event of a natural disaster, which can also ensure that they obtain more rapid relief.

Whilst it is difficult to assign a specific value to these benefits in terms of contribution to GDP or employment, it is agreed that many of these social and educational benefits could make people happier, healthier and more motivated; and hence more employable and able to contribute to GDP.

We have estimated value using the willingness to pay concept14. This seeks to calculate the increase in consumer surplus that has resulted from a change in the price of a good.

Figure 10: Increase in consumer surplus following a reduction in price



Source: Deloitte methodology

Historical average revenue per user (ARPU) shows us how much customers are willing to pay for mobile services. If it is assumed that these intangible benefits of owning a mobile are unchanged over time, then the value for this form of consumer surplus can be considered to be the difference between ARPU at the time of subscription, less ARPU today (which is likely to be less due to increased competition and other factors). The total increase in consumer surplus has been calculated as PKR 42 bn.

[14] For example, see McKinsey in "Wireless Unbound", 2006

Table 10: Calculation of intangible benefits using willingness to pay concept

Increase in consumer surplus	2003	2004	2005	2006
2002 subs	-	2,095,236,856	9,935,131,092	12,701,470,645
2003 subs	-	579,210,614	2,139,231,647	2,689,691,609
2004 subs	-	-	8,330,751,487	11,270,292,079
2005 subs	-	-	-	15,503,932,913
2006 subs	-	-	-	-
Total consumer surplus	**-**	**2,674,447,470**	**20,405,114,225**	**42,165,387,247**

Source: Deloitte calculation based on operator information

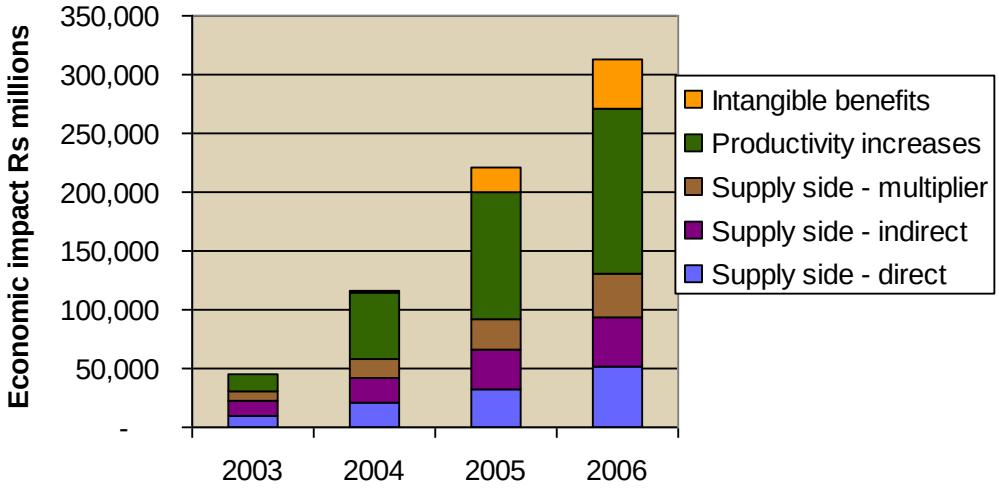
These estimates may underestimate the true value of intangible benefits due to:

- Data limitations, it assumes that all subscribers joined the network in 2003 and does not account for the increased willingness to pay that would have resulted from the higher ARPUs in early years; and
- Assumption that the number of subscribers in each year is a function of price. However, subscriber levels during the period are highly influenced by the level of network coverage and therefore, had mobile coverage been greater, then it is likely more subscribers would have been signed up at higher ARPUs in the early years.

Total static impact on economic welfare

The aggregation of the supply-side, demand side and intangible benefits provides an indication of the total economic impact of mobile communications in Pakistan. This is estimated to be PKR 312,522m in 2006. The biggest contributors are the direct and indirect supply side impacts and the demand side productivity increases. There has been a substantial increase in the economic impact in 2006

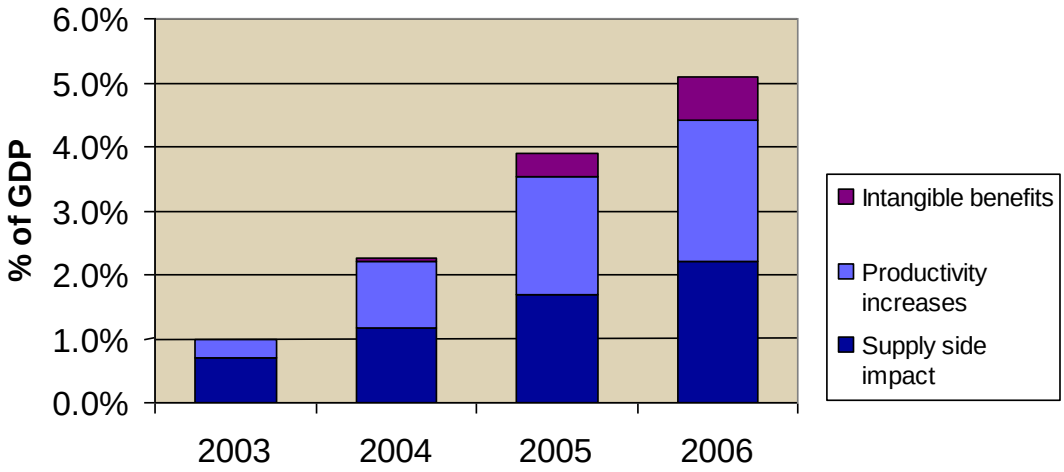
Figure 11: Economic impact of mobile communications in Pakistan (PKR millions)



Source: Aggregation of previously calculated effects

The impact of mobile communications on GDP has been substantial. We estimate that the total economic impact of mobile communications was 0.9% of GDP in 2003 increasing to 5% of GDP in 2006.

Figure 12: Economic impact as a percentage of GDP



Source: Aggregation of previously calculated effects

5 RESEARCH SYNOPSIS

PAKISTAN'S MOBILE COMMUNICATION SECTOR – ALWAYS SEEN FROM THE CONSUMER'S PERSPECTIVE NEVER FROM THE PROVIDER'S

"26th Oct 2007: Pakistan's smallest cellular phone company by subscriber numbers, Instaphone may have been sold to SK Telecom of South Korea with management control and majority shares, according to unofficial sources" (Bhatti, 2007)

Competitive market, more choice for customers, better service and falling prices ensuing the much appreciated consumer surplus; this is how Pakistan's booming Telecom sector is seen today. Does the statement stand true when witnessed from the service providers' binoculars?

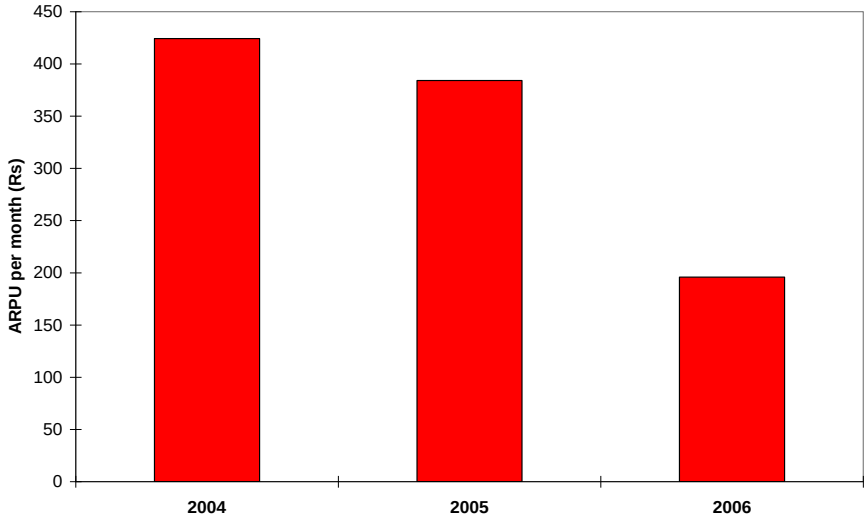
6 OPERATOR'S SIDE OF THE STORY

Key Competition Trends and Prospects

Mobile Market nearing almost 50% penetration

The mobile subscriber base continues to grow, but will eventually slow down. Competition is intense, both on the grounds of price and non-price sweeteners. Falling Average revenues per use (ARPUs) and the expectation of lower relative ARPUs in rural areas combined with relatively high SACs (Subscriber Acquisition Costs) represent a barrier to further roll-out in rural areas by the MNOs.

Figure 13: Historical Trend of ARPUs



Source: Deloitte based on mobile operators data

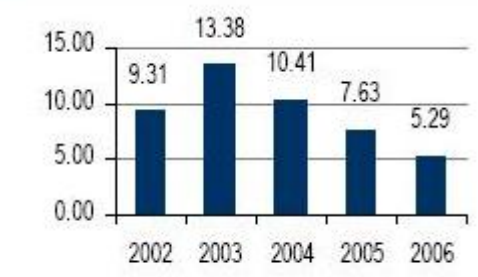
Mobilink Dominates but Market Grip Falters

Mobilink remains the largest mobile operator, with market share of 41%. However, its market share is falling and the operator is facing extreme competition. In particular, Ufone, Warid and now Paktel have been aggressively setting the tone as far as pricing is concerned. The operator has offered attractive pricing packages, bundles and sweeteners in a bid to wrestle market share from its strong rival, Telenor. Telenor is close to taking over Ufone, which will make it the second-largest mobile operator in subscriber terms.

Importance of Mobile Data

The sheen has been taken off the growth argument of the telecom sector to some extent as current average ARPU's of US$4 for cellular operators are among the lowest in the world and continue to decline. While growth via prepaid connections and declining tariffs has played their part, the role of inactive SIMs cannot be ignored. Inactive SIMs are assumed to have risen to 25% of outstanding SIMs and they represent not only a highly penetrated market but also a drag on ARPUs.

Figure 14: ARPU Trends



Source: KASB estimates, PTA

Pakistanis - particularly the younger generation, which makes up the bulk of pre-paid subscribers - are keen users of SMS. Tempting them with cheap text rates and extras such as multimedia messaging services (MMS) should help operators boost, or at least stabilise, average revenue per user (ARPU) levels. Operators have been moving up the chain by launching services such as BlackBerry wireless data devices to prepare consumers for the onset of 3G services. The focus on data revenues will become increasingly important as the market shrinks in quantitative terms.

Fierce Competition

It was the year 2005 when PTA for the first time reported subscriber figures for all six of the country's Mobile Telecom Operators. Mobile density back then stood at a mere 8.30%, which meant around 90% of Pakistan's potential subscriber base was untapped.

Situation

The increase in competition caused the per minute retail price of a mobile call in Pakistan to drop considerably. These decreases were particularly visible following the operational launch of Telenor and Warid in 2005. Mobile retail prices are low in Pakistan, compared not only to its regional neighbours, but also to countries in other continents.

Average retail price per minute*[15]

Table 11: Pakistan's average retail price per minute compared to other countries in the continent

Country	Average retail price (US$)
Pakistan	0.03
India	0.06
Bangladesh	0.07
China	0.09
UK	0.41
Sweden	0.17
Czech Republic	0.31

Source: Tarifica and mobile operators

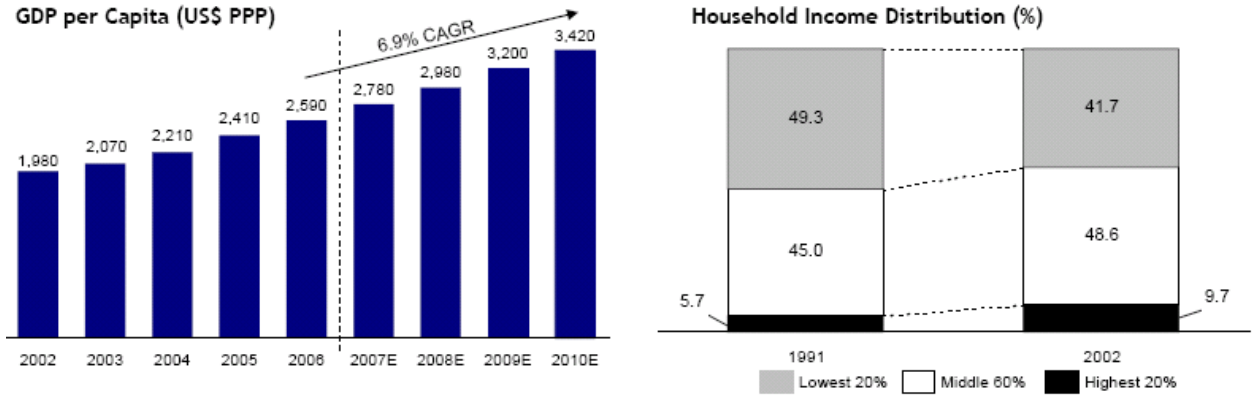
The fall in prices has resulted in lower ARPU levels which have not been matched by a similar decline in cost. Subscriber acquisition costs (SACs) are driven up by the SIM activation tax which is subsidised by operators. Currently, SACs are in excess of 4 months ARPU, while industry standards suggest 1 to 2 months.

Question

The question remains, even in the name of competition, why would an operator reduce prices till an extent that its margins are unnecessarily reduced and growth jeopardized; that too when the consumer is ready to pay for the service. Not only because it has become a dire need but because they can now afford it. Wealth levels have increased in the nation and a large middle-class in emerging.

* Prices calculated from Tarifica data as the weighted average of price of call per minute to on-net, off-net, fixed and international, weighted by estimates of destination.

Figure 15: GDP Per Capita and Income Distribution



Source Economist Intelligence Unit, Federal Bureau of Statistics

If the operator by doing so is making an effort to drive its competitors out of the market it is at the same time risking its own continued existence in it.

ANALYSIS - Telcos in a Price War

– **A State When Price Cuts Start Driving Market Growth**

Handsets – The culprits

The exponential growth in the mobile sector would not have been possible without a parallel growth in the handsets market. Although Pakistan's handset market comprises of a number of authorised dealers, still large portion of handsets come illegally via smuggling, individual carrier of new/used/refurbished sets from European and Middle Eastern Markets and other routes. During July-November 2006 of last year, mobile phones worth $294.7 million were imported in the country as compared to $51.3 million during the same period in 2003. Retailers believe that the number of handsets imported currently in the country has crossed the figure of one million per month.

Mobile phone companies reduced the rates of sets boosting the trend of replacing old mobiles with new ones. This strategy worked well for the mobile manufacturers but ended up raising havoc for the mobile network operators. Cheaper handsets meant demand from the low income bands but urban and rural. Regulators added fuel to the fire by introducing the Universal Service fund, which was meant to provide telecommunication to the rural underserved areas of the country.

How the price reductions began

As handsets got cheaper Mobile phones shifted from the consumer's perception of them being luxury accessories to becoming commodities and necessities. Handsets triggered demand for mobile network connections. The margins that Telcos could earn earlier did not make sense anymore because for example a Rs.2500 handset did not justify a connection worth Rs.3000. The regulators in turn reduced SIM Activation Tax which was a major component of the connection cost. This way they used the opportunity to increase mobile penetration and coverage in the country as they were aware of the socio-economic benefits that this medium of communication had brought about.

The temptation to grab the market made the Operators make a grave mistake. They changed the economics of the industry overnight by reducing prices to attract subscribers. From a supply driven oligopolistic market where margins were high, the industry prematurely turned to the mass market and sacrificed huge profits. Price reductions were initiated and even though the market could have been hugely benefitted from by the supplier they chose to be driven by the demand. And as it clearly happens, a demand driven market is in other words a price driven market where growth is driven by price and both are inversely related.

Intense Segmentation

Cheaper connections turned to free connections, which meant buying a SIM card that already had credit in it. This commoditization had a risk that the companies might loose their brand identities and SIM cards would end up being off the counter items in shops. Company brands and logos had the threat of becoming immaterial for the consumer just like flour, sugar and lentils in departmental stores. The intelligent way to deal with the problem was to segment the market and serve the customer by creating brands and packages that catered to their individual needs.

Sticking to the prepaid connections which dominate more than 85% of the market, packages that immerged to cater to the lower income segment included: Jazz Easy and Telenor Azadi. Once the segmentation gimmick took its toll other brands under the umbrella of the corporate brands were born: Jazz Octance, Jazz Ladies First, Telenor Talk Shawk, D'Juice, Ufone Prepay, Warid Zem and many more.

Effective segmentation worked, and the telecom industry with fierce competition still continues to earn reasonable margins because users are able to relate to the brands, as they know that the industry players have identified their needs and requirements, and serve them personally with numerous product and service offerings.

A Snapshot of Current State of the War

Intense price war after Mobilink's Jazz Ladies First (JLF) late night offer (21st Jun 07). All the major operators have now joined in with the most aggressive offer coming recently from Ufone in form of new package called Prepay Life.

- **Telenor - Djuice Night Offer (31st July 07):** Djuice responded to JLF STC offer with Rs. 4 per hour offer (F&F only). Charging pulse changed from 60 to 30 seconds with revision in on-net tariff as well
- **Warid - Zem Nites (16th Sep 2007):** A late night package offering free on-net calls on daily deduction of Rs. 24+Tax
- **PTCL (Fixed line operator) - Rs. 3.99/hour (16th Sep 2007):** PTCL also joined the race by offering Rs. 3.99 per hour on intra-city local calls valid till 31st Dec 2007.
- **Paktel (China Mobile) - Talk Free (1st Oct 07) :** Up to 2,000 on-net free minutes for monthly deduction of Rs. 400. Free minutes applicable throughout the day
- **Ufone - Prepay Life (14th Oct 07):** New prepaid package targeting the LNO market offering Free late night calls, highly attractive SMS rates and discounted weekend rates

Table 12: Prices of competing offerings

Details	Jazz Ladies First	Telenor- Djuice	Warid Zem Nights	Ufone Prepay Life
On-net (Regular)	Rs. 2.5/1.5 per min *(Rs. 1.5 2nd min onwards)*	Rs. 1.25 / 30 sec	Rs. 0.75 / 30 sec	Rs. 1.13 / 30 sec
Off-net	Rs. 2.99 / min	Rs. 1.25 / 30 sec	Rs. 1.00/1.25 per 30 sec *(PTCL/OMO)*	Rs. 1.25 / 30 sec
Late Night Rate *(On-net only)*	**Rs. 5 per hour** *(11pm-7am)*	**Rs.4 per hour (F&F)** Rs. 0.50 per 30 sec *(Rates for 12pm-8am)*	**FREE** *(11pm-7am)*	**FREE** *(12am-7am)*
F&F Lines	N/A	5 (on-net only)	5 (on-net only)	N/A
F&F Rates	N/A	Rs. 0.50 / 30 sec Rs. 4 /hour (12-8am)	Rs. 0.50 / 30 sec	N/A
Weekend Rates/ Special Discount	Rs. 1.5 per min *(3pm-6pm)*	NIL	NIL	Rs. 0.45/30 sec *(weekend rate)*
SMS (On-net)	Rs. 1.00 / SMS	20 paisa/SMS	50 paisa / SMS	7.5/15/25 paisa per SMS
SMS (Off-net)	Rs. 1.50 / SMS	20 paisa/SMS	Rs. 1.00 / SMS	7.5/15/25 paisa per SMS
Monthly/Daily Deduction	NIL	NIL	Rs. 24 /day	Rs. 250/500 per month

PTA's Initiative

Floor Setting for Tariffs

After witnessing a significant reduction in the tariffs some of the fixed line and cellular mobile operators raised the issue and requested PTA to inctroduce floor price mechanism. The floor price mechanism, if implemented, would force the operators not to charge tariffs below a certain level. PTA has sought opinion of all the operators on the issue and based on the feedback received will decide accordingly.

An Analytical View of the Price Floor Mechanism

Setting price floors might seem attractive when mobile operators consider the competition amongst themselves, but in reality it would only mean a migration of subscribers to other modes of communication. PTA has made an effort to protect players within the industry but at the same time it should be equally responsible for protecting the mobile operators from threats from the whole telecom sector of Pakistan. With technological advancements such as CDMA which made fixed-line connections wireless and portable, this current competitive structure has become far too complicated to be solved by such isolated service wise corrections.

Product distinctions become more and more obscure; therefore it is highly recommended that such mechanisms be implemented uniformly in the entire sector. The case can be further explained by taking the example of PTCL, one of the biggest threats to the mobile sector. The fixed line service provider continues to reduce call rates with packages such as:

- Nation wide dialing at local rates all day on Sundays, with minimal monthly charges.
- Late night and happy hour rates
- International call rates clearly in competition with cheap offerings of calling cards which are in reality are dependant on PTCL's network itself.

Numerous alternative modes of communication becoming easily available to the consumers have not been considered in the paper. Some of the substitutes gaining rapid popularity include:

- Voice over Internet protocol
- Free Voice chat portals like MSN and yahoo messenger, which have been made ever so attractive by the affordable web connectivity conduits.
- National and International calling cards.

As for the case made for implementing price boundaries, if the competitive environment prevailing in the Mobile Telecommunication industry was bound to cause inefficient incumbents to go out of

business then logically it should be unattractive to new market entrants, whereas China Mobile continues to invest millions in setting up its network.

The huge investment and efforts being made by SMP operators should not go to waste. The industry needs to consolidate and the exploitation of these economies of scale by SMPs would not only ensure a better consumer experience but a self correcting industry where competition ensures that all players perform at their optimum level.

With the WTO regime in its infant stages, it is better to have a few strong players in the market to combat foreign competition rather than numerous protected smaller ones. This protection would only weaken the ability of the incumbent players to compete effectively with international competition; said with regard to the much ignored fact that bundled offerings and close substitutes make consumer choices more difficult with each passing day.

7 OUTCOMES OF THE WAR

Having looked at the competitive arena MNOs are playing in and how they have ended in it; two major possible outcomes can be predicted of the situation at hand. There would either be Industry wide consolidation or infrastructure sharing to ensure stable margins in the future.

Consolidation

Consolidation is brought about by a series of mergers and acquisitions among various players. The outcome is more breadth of service in larger geographic areas. Each company strives to be the "one-stop-shop" for all customer needs; an analysis of the current scenario reveals that Mobilink is on this track.

Moblink

Mobilink, with a subscriber base of 27m and growing, finds itself perfectly placed to help the country overcome this deficiency, by playing a vital role in bringing broadband to unconnected Pakistan.

From voice to data services Mobilink is adamant to make it big in the telecommunication industry by becoming the total telecom solutions provider. Making its debut with GSM voice services it has progressed to providing data services by laying down its own Fiber Optic backbone to serve the country and now turns to serving its citizens individually by launching WiMax.

- Fiber Optic

Pakistan Telecommunication Limited (PTCL) for the longest time had been the only company that owned its own optic fiber backbone; backhaul for transporting traffic between distributed sites (typically access points) and more centralised points of presence. Mobilink has successfully introduced competition through the introduction of a nationwide submarine link. Mobilink's optic fiber backbone provides the perfect platform to Mobilink for connecting its customers nation wide with highest level of voice and data quality with reliability.

Deployment of the national backhaul stands completed with full protection, thus making Mobilink the only service provider in the country with a fully protected/redundant optic fiber backbone. By providing connectivity till the last mile Mobilink has positioned itself as a one stop shop for meeting communication requirements of any enterprise. The Optic fiber network currently covers 6500 kilometers of area and will be increased to cover another 2000 kilometers very soon.

- WiMAX

Mobilink is planning to enter into data space by deploying state of the art WiMax network for providing high speed internet to its customers. WiMax is the latest technology for delivering broadband services to the end user.

With Alcatel Lucent, Huawei and Motorall amongst its list of renowned network vendors, Mobilink's WiMax infrastructure is in good shape to foresee a commercial launch very soon. WiMax is bound to bring a broadband revolution in the country with subscriber growth in multiple folds. This would not only bring Pakistan in par with technologically advance nations but will also stimulate data use in the country. Data services will flourish and demand in new arenas of data handling will be generated.

Mobilink recently entered into an agreement with four companies to consolidate its operations aimed at providing better wireless and broadband facilities for its customers; DVCOM, DanCom, Zarco and WOL. Leveraging on the assets and expertise thus acquired Mobilink plans to provide state of the art data services in addition to high speed internet; such as disaster recovery, data center and enterprise hosting services. With the basic infrastructure in place, keeping pace with technological advancements will be one of Mobilink's key priorities.

Diversification – Providing the total Telecom Solution

Diverting focus from voice to data services; Triple play might just be the next logical transition. Triple play has already made its way to Pakistan. Triple Play service is a marketing term for the 3 services: high-speed Internet, Video (TV, Video on Demand) and telephone service - all over a single broadband connection. Wateen, PTCL and Nayatel are a few examples for which services are already or soon to be available in some parts of Lahore and Islamabad.

Technology companies understand change is constant, yet few in the Pakistani Telecom sector expected to be dealing with so much, so fast. Within a matter of just a few years the competitive landscape of the industry has been fundamentally reshaped. But the pace of change is continuing. To regain firm footing and financial stability, most telco executives are feverishly scouting out new markets, new areas of growth, and new business opportunities.

Telecom players worldwide are racing to upgrade their transport and access infrastructures to enable cost-effective ways to provide new integrated services via a single network over a single access pipe. So old competitors are morphing into valuable allies and forming industry partnerships to extend and compliment existing technology and service offerings.

Broadband infrastructure is the backbone for providing Triple play services the the broadband business presents a sizeable opportunity for the MNOs. They can leverage their existing resources (subscriber

base, distribution channels, points of sale, infrastructure, etc.) to create synergies in the marketplace and become very competitive.

Elements of Broadband

Essentially there are 4 basic elements of Broadband, as also defined in the Broadband Policy.:

1. **Content**

In Pakistan at present local content in domestic infrastructure is mostly not available and if available then not in local languages. This reduces the incentive of the investors to invest in Broadband.

2. **Backhaul – National as well as International**

Thanks to the initiatives of Government/PTA - price reduction in International Bandwidth has been achieved with reasonable degree of success, however local peering is still not fully enabled which taxes the international IP transport infrastructure unnecessarily.

Enhancement and choice in International connectivity has also been achieved by capacity enhancement by incumbent as well as alternative international bandwidth providers now coming into the market with competitive offerings. National transmission backbone with add/drop infrastructure can be termed as "almost achieved" with three additional providers starting their services as of now. Consequently Backhaul charges are now at reasonably low levels which will reduce further as the new bandwidth providers expand and competition increases.

3. **Delivery**

There are mainly three types of delivery in play

- Wired DSL services, which are hampered by infrastructure limitations (low penetration and dismal performance of Copper wired plant) as well as high running costs that cannot be afforded by the general public.

- Wired Cable (TV) services, which are limited to only the big cities and that too mainly in posh areas. Otherwise the predominant "Mohallah" cable TV networks do not offer good enough quality and reliability to run broadband services on.

- Wireless access, like WiMax, WiFi-mesh, Edge and EvDo etc. are still in nascent stage in Pakistan and there are no affordable offerings in the market.

4. End-User Terminal

Also called Customer Premises Equipment (CPE) is the 4th pillar of Broadband. Cable-Modems, DSL terminals, media converters, etc. are now available at relatively low cost, mainly due to global downward price trends. On the other hand Wireless CPE's at affordable prices for average users in Pakistan are not available as of yet.

Figure 16: Elements of Broadband

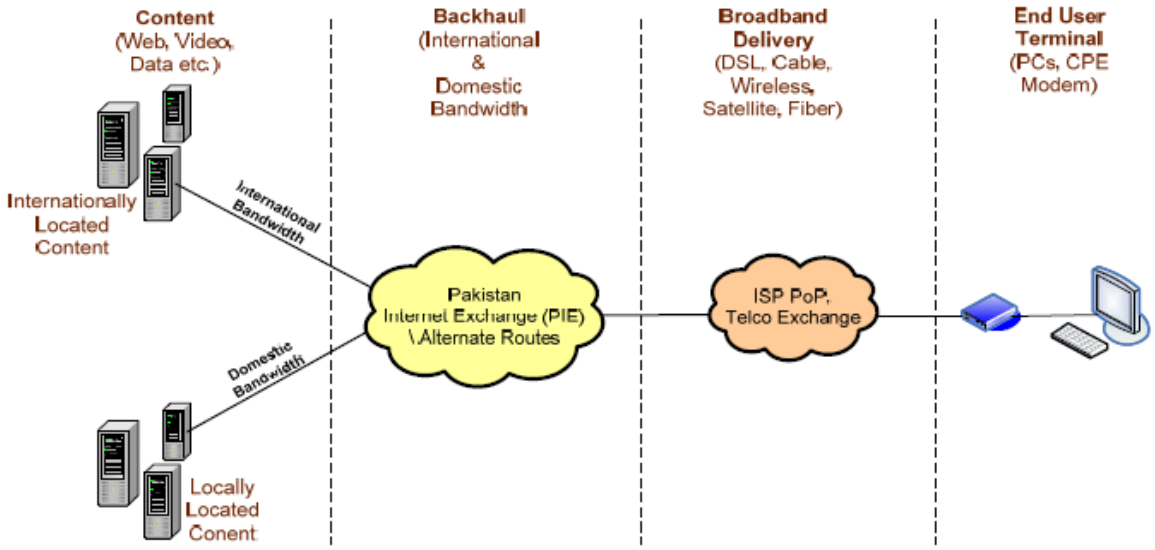
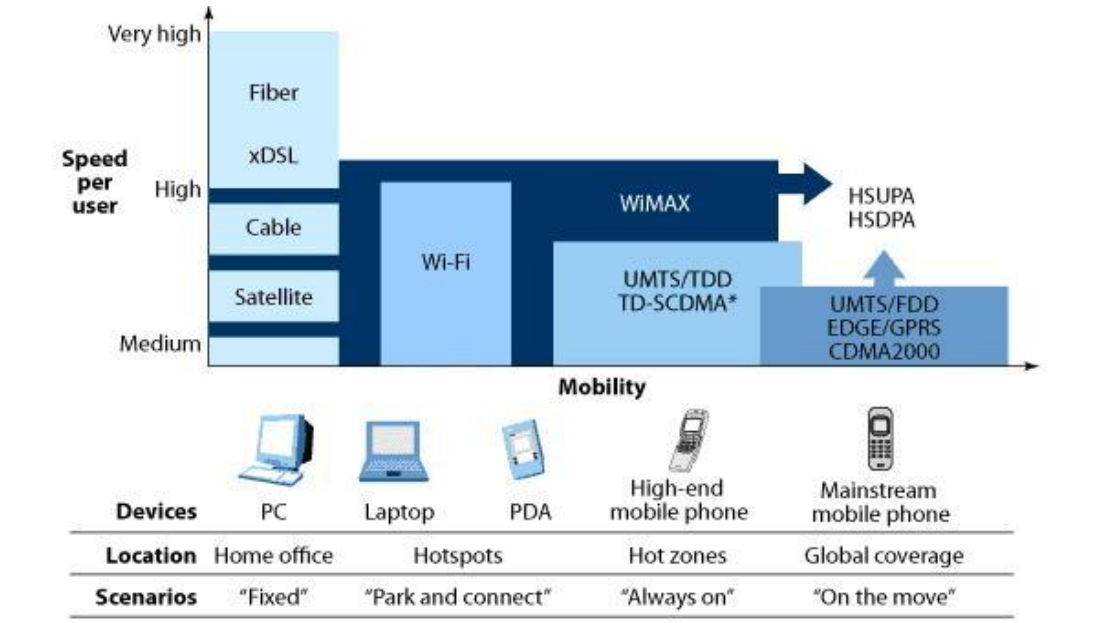


Figure 17: Technologies in Broadband



* Time-division synchronous code-division multiple access

Source: Alcatel and Forrester Research, Inc.

Overview of WiMAX in Pakistan (Bhatti, 2007)

Pakistan's telecommunication industry - mobile communication in particular - has made impressive strides in the last few years after deregulation. However broadband growth in the country has been very disappointing - there are less than 100,000 broadband users in Pakistan. The open competition observed in mobile industry has not been replicated to broadband. Reasons include high prices, control of PTCL over bandwidth resources, policy issues, lack of infrastructure and legal disputes.

Enter WiMAX. Simply stated, it's a relatively new standards-based wireless technology which is intended for large coverage areas on the order of several kilometers (instead of a few hundred meters, as is the case with Wi-Fi).

With base stations transmitting signals and some equipment at customer location, it promises fast bandwidth for both fixed locations and mobile users. In this backdrop, Pakistan made headlines in 2006 when Wateen announced plans to work with Motorola to rollout Mobile WiMAX, the largest network of its kind in the world.

Is WiMAX (Worldwide Interoperability for Microwave Access) the right technology for developing countries? In other words, will this new technology deliver the promise of broadband at affordable prices?

WiMAX comes with many theoretical advantages but its potential is yet unproven. Without getting too technical, it is purpose-built for Internet (IP) communication and is based on standards (as opposed to other proprietary solutions) endorsed by a respected world standards body, the Institute of Electrical & Electronic Engineers (IEEE)*.

In 2002 WiMAX was identified by Intel as an alternative or complement to the wireless broadband. Eventually Motorola and Intel became its biggest champions. On the other side of the camp were GSM operators of the world who saw WiMAX as a competing technology. As with any new technology, a lot of lobbying was done to make it an industry wide accepted technology. According to BusinessWeek,

"(Intel) rounded up a remarkable coalition of chip, PC, consumer electronics, networking, and software companies in an effort to radically reshape the future of broadband with what's now called WiMAX."

Currently the high prices of WiMAX 'customer premises equipment' (CPE) make it more expensive than fiber, cable or DSL. Wateen and others are counting on the trend of falling hardware prices for WiMAX. They would have to compete with the latest PTCL broadband campaign in which PTCL has dramatically reduced DSL prices at Rs 1200 per month for 256kbps speed with a 2GB limit. As a last mile solution, WiMAX may not compete on price at this time but if WiMAX is reliable, fast and operators provide better customer service then business users may pay some premium for it, say as a replacement for leased lines.

In addition to broadband Internet access, applications that are supportable with WiMAX supports multiplayer interactive gaming, streaming media, VoIP, video and teleconferencing, and media content downloads.

There are other potential benefits of WiMAX such as broadband access for rural areas or for areas that have no other reasonable broadband access. This is likely to be play an important role for developing countries. WiMAX can also reduce cost of transmission lines such as backhauls from cellular sites or cross-town links. To summarize, improved access and mobility are the major advantages promised by the WiMAX camp.

Even today the industry is full of discussions and debates, comparing WiMAX with technologies such as 3G. About 65 countries are experimenting with WiMAX and the results will vary by country depending on the spectrum availability, existing infrastructure and market conditions.

Coming back to Pakistan, the major initiatives include:

- **Wateen** - which is using WiMAX solution from Motorola and its cable/fiber network to offer triple play of phone, TV and broadband. Trials have been extended for over a year. Most aggressive to market their bundled solutions, they have started advertising without providing pricing and availability information.

- **Mobilink** - has formed a new entity called Link Dot Net (LDN) to focus on broadband market. WiMAX infrastructure was piloted by Mobilink in 3 cities and a recently issued RFP has generated 7 proposals to cover 5 major metros, including in-building coverage for high value business areas. Malaysia's Dancom, which conducted early trials of WiMAX in Karachi, was acquired by Mobilink's LDN in 2007. Mobilink also bought DV Com and its licenses.

- **Burraq Telecom** - which was acquired by ACT consortium which includes Qatar Telecom and Clearwire Corporation, an American operator providing WiMAX services in 10 countries, also plans to offer WiMAX.

The pricing has not been announced by these companies yet. Business users in Pakistan desperately need reliable broadband and are the desired customers because of their high affordability levels. Consumer market is different as demand varies by demographics' low price is the dominating success factor.

What about the existing telecom infrastructure in Pakistan? For one, the GSM infrastructure in Pakistan is mainly focused on voice. 3G licenses are expected to be awarded at the end of 2007, paving the way for HSDPA - the high speed standard for GSM - in Pakistan . The existing 2 or 2.5G mobile Internet is available in selected areas and the number of users for the mobile broadband services remains low. It is

yet to be seen if WiMAX, with its higher speeds** and costs, will find a large number of users in this category in Pakistan.

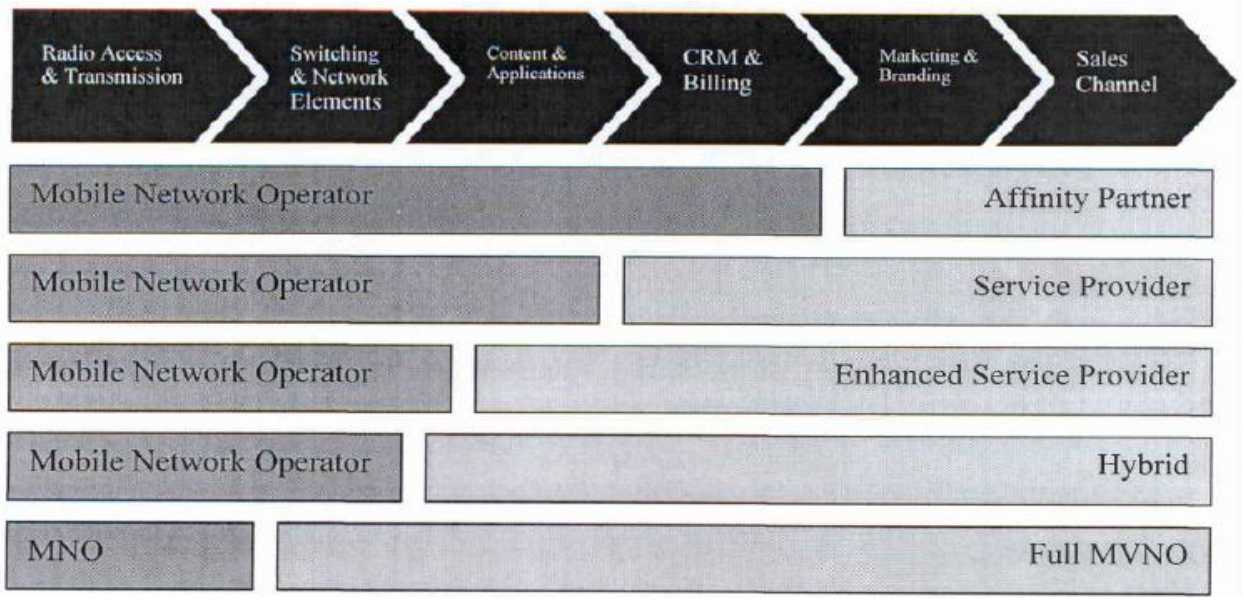
Spectrum is another important factor - even a show-stopper - in many countries where spectrum availability can mean all the difference. For Pakistan, PTA, the communications regulatory body has allocated spectrum in 3.5 GHz range for WiMAX. The CDMA wireless phone operators such as PTCL (Vfone) and Worldcall, which offer limited mobility, also have licenses in the 3.5GHz range and they are also likely to offer WiMAX services after getting approvals from PTA.

Birth of MVNOs

Another probable move would be wholesales by the Mobile Network Operators; which is a way of ensuring a certain rate of margin when market dynamics put direct sales margins at risk.

Mobile Virtual Network Operators (MVNOs) are believed to be one of the top ten emerging telecom trends in Asia. Pakistan Telecom Authority defines Mobile Virtual Network Operator (MVNO) as an operator that does not own spectrum but has commercial arrangements with conventional Mobile Network Operators (MNOs) to buy minutes of use (MoU) for sale to its own customers. The 5 MVNO models approved by PTA are:

Figure 18: MVNO Framework



Source: PTA's Framework for MVNO Services in Pakistan

In May 2007 PTA released a brief framework for Mobile Virtual Network Operators. A few points from the framework:

- PTA will oversee and approve the MVNO agreements and breakups.
- PTA shall allocate separate number blocks to MNOs for use by its MVNO partner.
- MVNOs cannot sign separate roaming agreements with operators other than the parent network operator.
- MVNOs will contribute to universal service fund and research & development fund, among other fees.
- Accompanying the 3-page framework, there's an appendix (pdf) which includes a checklist, fee schedule and application form.

PTA has done a decent job with introduction of the framework and has kept the barrier to entry (fees, conditions etc) for MVNOs fairly low. Let's see how many nationwide MVNOs get started in Pakistan in the near future.

8

INDUSTRY ANALYSIS - Facts to Figures

A Numerical Overview

Telecom Business Acronyms

- EBITDA: Earnings Before Interests, Tax, Depreciation, and Amortization
- ARPU: Average Revenue Per User = ARPM x MOU
- ARPM: Average Revenue Per Minute
- MOU: Minutes of Usage,
- Churn: Writing off a subscriber number. In case of pre-paid it means that the connection has not been recharged after expiry of balance validity and has been inactive for a certain period of time after that. Postpaid numbers are considered churn after the monthly dues have not been cleared till a certain time.
- Dormant Subscribers: Subscribers who only recharge their connections to keep it active but do not generate any revenue for the operator. Recharge before expiry makes it impossible for the operator to churn the number. Only pre-paid numbers can become dormant because postpaid connections have monthly dues that need to be paid or the number is churned.

Telecom industry financials differ greatly from those of other firms in the service sector. The knowledge about key performance indicators, financial structures and reporting methods is not common in Pakistan which is largely because five out of the six telecom operators in the country are foreign owned subsidiaries; and none of them are listed on the local stock exchanges.

While balance sheets are amongst the biggest concerns when analyzing a company; the Telecom sector's competitive analysis in Pakistan and even around the globe only has its focus on what goes on till the Earnings before Interest Depreciation and Amortization (EBITDA). This is so because:

- Consolidated reports by the holding companies do not publish separate balance sheets for their sister concerns or subsidiaries in Pakistan. Global operations of companies for example SingTel, Orascom, and Telenor resulted in the realization that EBITDA figures are all that holding companies are concerned with; because balance sheets of these investments are totally at the holding company's discretion.

- Financing structures differ greatly between the operators, thus the interests paid or the dividends given out; which can then make net profit level comparisons stand void.

- The subscriber base, Average revenue per user, Minutes of use (MOUs) per subscriber for the operator, Subscriber Acquisition Cost (SAC) and Subscriber Churn rate (percentage of the operator's subscribers that leave its network for another competitor or because they were not satisfied by the operator's offerings); are amongst the key indicators that have been trailed and tested to be amongst the most sound predictors of competitive health and future projections for the operator.

A Top-down approach will be used to walk through the numerical side of the telecom industry. The analysis would use historic data as a base case to project the future trends in the industry.

Based on the historical trends and the following assumptions a snapshot of the industry's position five years down the lane has been projected.

Basic Assumptions

- Subscribers:
    - Positive impacts of China Mobile's takeover of Paktel have became visible in September 2007 when the company finally added around 190,000 subscribers after months of high churn and low net additions to the company's subscriber base. This trend is seen to continue over the next few years as the new investments in the company were diverted to intense network converge and expansion efforts that have been witnessed.
    - As the addressable market increases the bigger players will loose market share to new entrants even if they maintain the same rate of growth. This trend is projected to continue till the market gets fully penetrated.

- Industry ARPU

    - Using Average Revenue trends per user of two of the major players of Pakistan; Mobilink and Telenor an industry average has been assumed. This would safely represent more than 50% of the market.

Figure 19: Blended ARPUs (Weighted Average Revenues for Post-paid and Prepaid Connections)

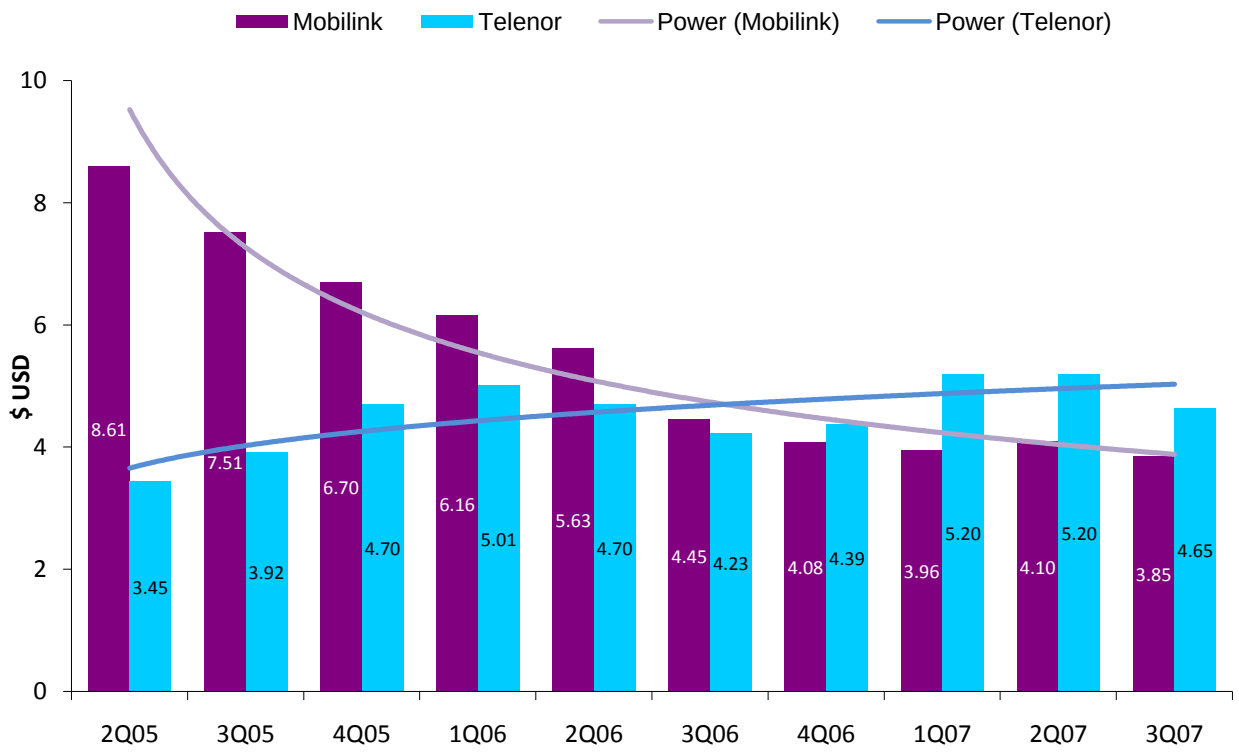
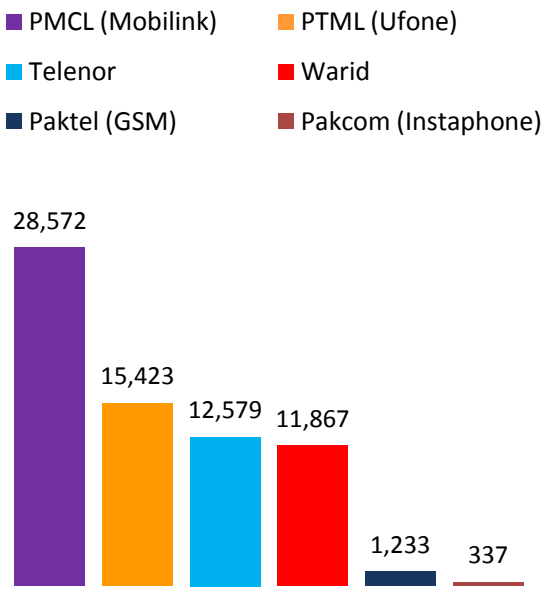


Figure 20: Subscriber Base of MNOs as at Sept 07

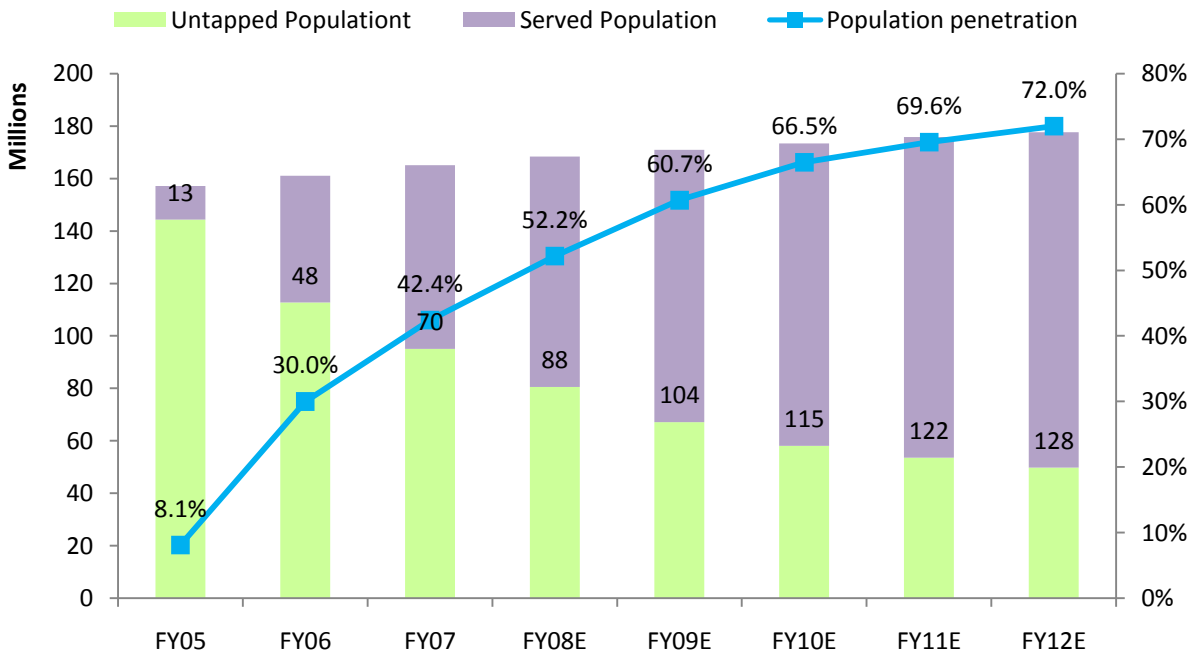
(Figures in thousands '000)



High Market Shares do not ensure high revenues as can be seen for Mobilink. Strong brand and competitive prices have brought Telenor forward as a fierce competitor for Mobilink. Both companies have drastically cut prices across the board but Telenor has been able to recover revenues by triggering higher usage through effective marketing.

Mobilink is projected to reach 30million subscribers by the end of year 2007 while Telenor will come close to beating Ufone as the second largest player in the market.

Figure 21: Penetration Forecasts



Using historical trends and comparison with Telecom Industries that witnessed similar growth rates 72% penetration in next 5 years is still slightly understated but a safe estimate. There is though a catch with penetration rates. The market might be growing fast but the inherent problem with telecom indicators is dormant subscribers. Dormant subscribers are prepaid subscribers who are on an operator's network but do not generate any revenue for it. They load they're accounts just before they know their connection will churn and be disconnected for good.

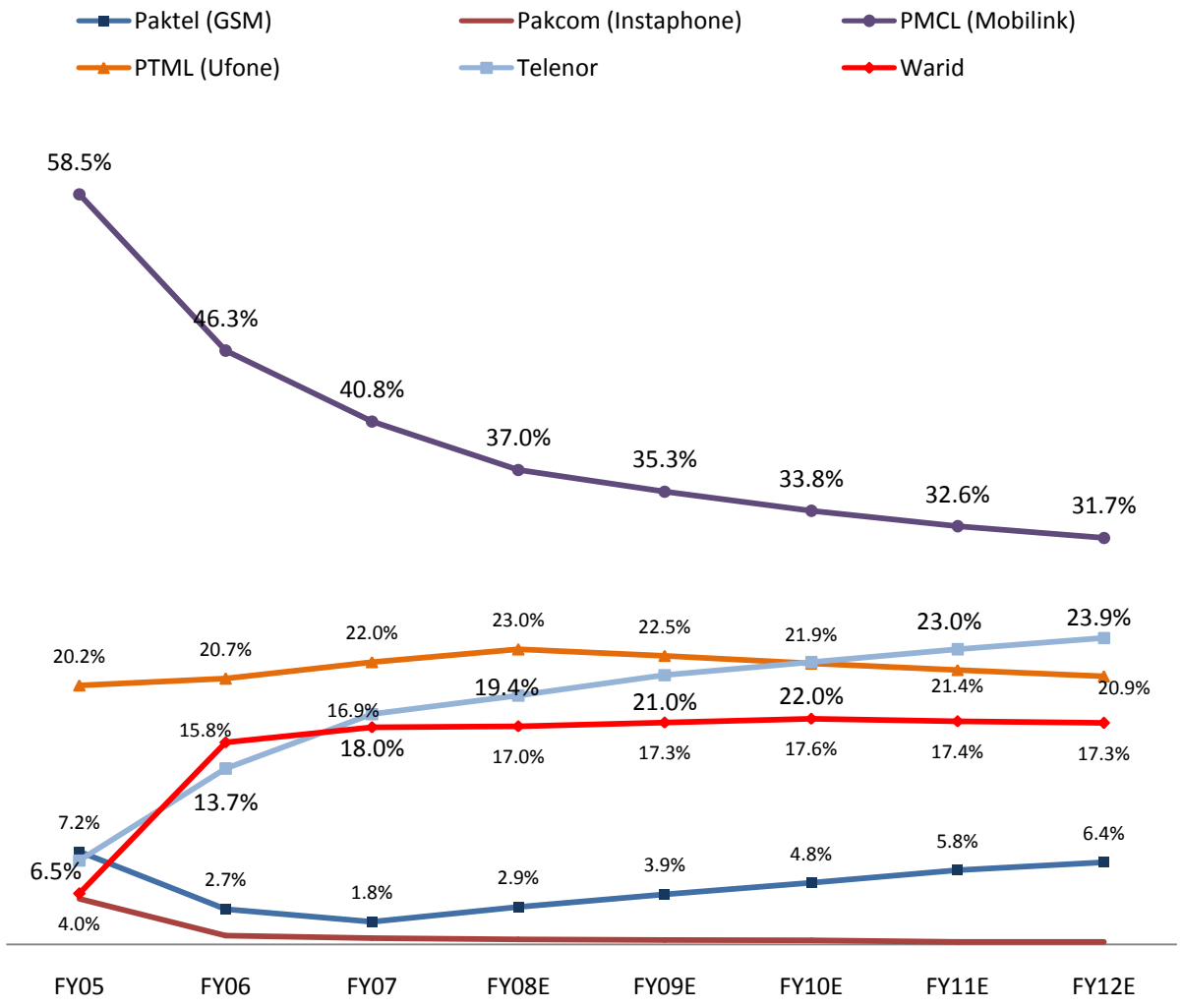
As the competition in the market hypes up, and connections get cheaper owning multiple SIMS/Connections becomes a common phenomenon. Even though mobile number portability has already been introduced, when a new connection is practically free the buyer does not bother getting the number ported to the network of his/her choice. Instead he/she would buy a new connection and keep the older one active just for the sake of the number. Up to 40% of an operator's connections can be dormant. To add to the problem, handsets are getting cheaper by the day making it affordable to keep more than on handset to keep the dormant connection for churning.

This is why Singapore's mobile penetration has touched 104%. It is when the market is deemed fully penetrated corrective measures seep in. Regulations become more stringent and reported figures more realistic. Till then we would continue to see a flourishing telecom sector.

The growth rate of subscriber base is not directly proportionate to market shares of operators. Instead as soon as the potential for growth in the total subscriber base is seen new players are attracted to the market and continue to be attracted even when competition is high till no player is able to earn abnormal margins. In economic terms such a market would be termed as one in the state of perfect

competition. So if the market is seen as a pie then the share of the operators in the pie will continue to decline as it grows and because till its growing the market will remain attractive to new investors.

Figure 22: MNO's Market Shares



Industry Projections and Forecasts

Based on the theory given earlier and from past trends we can clearly see and thus forecast declining market shares for big players and increasing shares for new ones till all reach a level playing ground with; in terms of their individual subscriber bases. Using penetration and market share projections an overall industry future forecast is given in the table that follows.

Table 13: Industry Forecast

	FY05	FY06	FY07	FY08E	FY09E	FY10E	FY11E	FY12E
Papulation ('000)	157,171	161,100	165,128	168,430	170,957	173,434	175,862	177620.7
% Change	*2%*	*3%*	*3%*	*2%*	*2%*	*1%*	*1%*	*1%*
Population penetration	***8.1%***	***30.0%***	***42.4%***	***52.2%***	***60.7%***	***66.5%***	***69.6%***	***72.0%***
Wireless market (000)	12,771	48,340	70,061	87,921	103,794	115,314	122,334	127,887
% Change	154.26%	278.51%	44.93%	25.49%	18.05%	11.10%	6.09%	4.54%
Net adds (000)	7,748	35,569	21,721	17,683	16,488	11,655	7,041	5,535
% Change	*196%*	*359%*	*-39%*	*-19%*	*-7%*	*-29%*	*-40%*	*-21%*
Monthly additions (000)	646	2,964	1,810	1,474	1,374	971	587	461
% Change	*196%*	*359%*	*-39%*	*-19%*	*-7%*	*-29%*	*-40%*	*-21%*
Subscriber market share								
Paktel (GSM)	7.2%	2.7%	1.8%	2.9%	3.9%	4.8%	5.8%	6.4%
Pakcom (Instaphone)	3.6%	0.7%	0.5%	0.4%	0.3%	0.3%	0.2%	0.2%
PMCL (Mobilink)	58.5%	46.3%	40.8%	37.0%	35.3%	33.8%	32.6%	31.7%
PTML (Ufone)	20.2%	20.7%	22.0%	23.0%	22.5%	21.9%	21.4%	20.9%
Telenor	6.5%	13.7%	18.0%	19.4%	21.0%	22.0%	23.0%	23.9%
Warid	4.0%	15.8%	16.9%	17.0%	17.3%	17.6%	17.4%	17.3%
SCO	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Subscribers by operator ('000)								
Paktel (GSM)	924	1,328	1,233	2,573	4,048	5,535	7,095	8,185
Pakcom (Instaphone)	454	330	337	350	353	363	245	256
PMCL (Mobilink)	7,469	22,375	28,572	32,531	36,639	38,976	39,881	40,540
PTML (Ufone)	2,579	10,017	15,423	20,222	23,354	25,254	26,179	26,728
Telenor	836	6,625	12,579	17,051	21,797	25,369	28,137	30,565
Warid	509	7,615	11,867	14,947	17,956	20,295	21,286	22,077
SCO 8	0	50	50	71	85	95	105	112
Total	**12,771**	**48,340**	**70,061**	**87,921**	**103,794**	**115,314**	**122,334**	**127,887**
Annual net additions - ('000)								
Paktel (GSM)	454	404	95	1,340	1,475	1,487	1,560	1,089
Pakcom (Instaphone)	82	124	7	13	3	10	118	11
PMCL (Mobilink)	4,253	14,906	6,197	3,959	4,109	2,337	905	659
PTML (Ufone)	1,778	7,438	5,406	4,799	3,132	1,900	926	549
Telenor	836	5,789	5,954	4,472	4,745	3,572	2,768	2,428
Warid	509	7,106	4,252	3,080	3,010	2,339	991	791
SCO*	-	50	0	21	14	10	10	7
Total	**7,748**	**35,569**	**21,721**	**17,683**	**16,488**	**11,655**	**7,041**	**5,535**

Net addition market share								
Paktel (GSM)	5.9%	1.1%	-0.4%	7.6%	8.9%	12.8%	22.2%	19.7%
Pakcom (Instaphone)	-1.1%	-0.3%	0.0%	0.1%	0.0%	0.1%	-1.7%	0.2%
PMCL (Mobilink)	54.9%	41.9%	28.5%	22.4%	24.9%	20.0%	12.8%	11.9%
PTML (Ufone)	22.9%	20.9%	24.9%	27.1%	19.0%	16.3%	13.1%	9.9%
Telenor	10.8%	16.3%	27.4%	25.3%	28.8%	30.6%	39.3%	43.9%
Warid	6.6%	20.0%	19.6%	17.4%	18.3%	20.1%	14.1%	14.3%
SCO	0.0%	0.1%	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Industry ARPU	**5.81**	**4.83**	**4.34**	**3.82**	**3.25**	**2.60**	**2.34**	**2.22**
		-17%	-10%	-12%	-15%	-20%	-10%	-5%
Dormant Subs			30%	30%	35%	40%	40%	40%
Undiluted ARPU			$5.64	$4.96	$4.38	$3.64	$3.27	$3.11

As market shares go down and the price war further aggravates the situation of falling EBITDAs MNOs need to take some corrective measures. As stated earlier; one of the possible and immediate solutions to the problem is consolidation. Consolidation at a simple level would initially mean adding more complex data services to the current plain vanilla voice and data offerings. The second and more sophisticated move would be to become the total telecom solution provider and get into triple play; through provision of all three modes of communication; Voice data and video.

Scenario Analysis

To better understand the need of such an effort a three prong analysis has been done which studies three scenarios. The financial calculations' end result would be a comparison of EBITDA margins for the following three scenarios:

- MNO only selling Voice services
- MNO only selling Voice and Data services
- MNO selling Voice, Data and WiMax services

Assumptions

The assumptions used for calculations have been highlighted in red. They are based on past trends in the sector and actual occurrences in comparable economies. As for the subscriber additions per month; the figures will drop as operators go into rural areas which require the same amount of capital investment but are not as densely populated as the urban areas to be able to get the same number of subscribers. This would lead to reduced subscriber additions per month as urban areas reach full penetration and shift to rural market becomes essential.

Table 14: Assumptions for Scenarios

ASSUMPTIONS	FY08E	FY09E	FY10E	FY11E	FY12E
Average addition to subscribers/month	900,000	765,000	650,250	585,225	555,964
% Increase/Decrease		*-15%*	*-15%*	*-10%*	*-5%*
ANNUAL CHURN					
GSM Business	10.0%	11%	12%	13%	15%
% Increase/Decrease		*5%*	*10%*	*12%*	*16%*
WiMax Business	3.0%	3%	4%	5%	6%
% Increase/Decrease		*12%*	*15%*	*20%*	*25%*
WiMax Uptake (% of Gross Adds)	20%	30%	40%	60%	80%
Voice Revenue - Diluted:					
Blended ARPU	$4.96	$4.38	$3.64	$3.27	$3.11
% Increase/Decrease		*-12%*	*-17%*	*-10%*	*-5%*
% Increase/Decrease		*-15%*	*-10%*	*-10%*	*-10%*
WiMax ARPU					
Business - 20%	$250	$213	$170	$139	$120
Residential - 80%	$20	$17	$14	$11	$10
WiMax ARPU	**$66.00**	**$56.10**	**$44.88**	**$35.90**	**$28.72**
% Increase/Decrease		*-15%*	*-20%*	*-18%*	*-14%*
Costs					
Subscriber's Acquisition Cost (SAC)	$12.00	$13.20	$14.52	$15.97	$17.57
% Increase/Decrease		*10%*	*10%*	*10%*	*10%*
Dealer Commissions					
Acquisition *(x months ARPU)*	2	2	2	2	2
Usage *(% of ARPU)*	2%	2%	2%	2%	2%
WiMax Acquisition Costs	$200.00	$180.00	$162.00	$145.80	$131.22
% Increase/Decrease		*-10%*	*-10%*	*-10%*	*-10%*
Opex without SAC/Sub					
GSM	$2.00	$1.90	$1.81	$1.71	$1.63
WiMax	$4.00	$3.80	$3.61	$3.43	$3.26
% Increase/Decrease		*-5%*	*-5%*	*-5%*	*-5%*
Revenue Sharing	3%	3%	3%	3%	3%

As competition increases subscriber acquisition costs would get higher resulting from more marketing expenditure and cost absorption in order to charge competitive prices. WiMax acquisition costs are projected to fall over the coming years as with any new technological innovation when the equipment is mass produced and prices eventually drop. Revenue sharing is a regulatory imposed cost on the operator's revenue.

WiMax uptake is a percentage of the total subscribers because new technologies take a while to be absorbed in the market. Keeping in mind the Country's ICT infrastructure low penetration figures have been projected in the initial years.

Using these assumptions the following base is used to calculate three scenarios which will be differing on the basis of service offerings.

Subscriber Base

Table 15: Subscribers used for Scenarios

SUBSCRIBERS	FY08E	FY09E	FY10E	FY11E	FY12E
GSM Subscribers					
Opening Subscribers	-	9,720,000	16,915,500	21,863,513	25,149,493
Gross Additions	10,800,000	9,180,000	7,803,000	7,022,700	6,671,565
Churned	1,080,000	1,984,500	2,854,987	3,736,721	4,774,992
Net Adds	**9,720,000**	**7,195,500**	**4,948,013**	**3,285,979**	**1,896,573**
Subscribers YTD	**9,720,000**	**16,915,500**	**21,863,513**	**25,149,493**	**27,046,066**
WiMax Subscribers					
Opening Subscribers	-	2,095,200	2,591,067	2,900,478	3,883,754
Gross Additions	2,160,000	2,754,000	3,121,200	4,213,620	5,337,252
Churned	64,800	162,933	220,722	329,866	534,449
Net Adds	**2,095,200**	**2,591,067**	**2,900,478**	**3,883,754**	**4,802,803**
Subscribers YTD	**2,095,200**	**4,686,267**	**5,491,545**	**6,784,232**	**8,686,556**

Scenario 1: Voice Only

Table 16: MNO selling Voice services only

EBITDA Margins	FY08E	FY09E	FY10E	FY11E	FY12E
Revenues ('000)					
Voice	$579,113	$889,593	$953,917	$987,557	$1,008,929
Data	$0	$0	$0	$0	$0
WiMax	$0	$0	$0	$0	$0
Total	**$579,113**	**$889,593**	**$953,917**	**$987,557**	**$1,008,929**
COGS ('000)					
Acquisition Costs					
Voice + Data	$129,600	$121,176	$113,300	$112,167	$117,214
Wimax	$0	$0	$0	$0	$0
Acquisition Commissions					
Voice + Data	$107,243	$80,463	$56,742	$45,961	$41,479
Wimax	$0	$0	$0	$0	$0
Revenue Sharing	$17	$27	$29	$30	$30
Total	**$236,861**	**$201,666**	**$170,070**	**$158,157**	**$158,724**
Gross Profit	**$342,252**	**$687,927**	**$783,847**	**$829,401**	**$850,206**
Margins %	*59%*	*77%*	*82%*	*84%*	*84%*
OpEx ('000)					
Usage Commission					
Voice + Data	$9,652	$7,242	$5,107	$4,136	$3,733
Wimax	$0	$0	$0	$0	$0
All other OpEx	$233,280	$385,673	$473,564	$517,501	$528,701
Total	**$242,932**	**$392,915**	**$478,670**	**$521,638**	**$532,434**
EBITDA	99,321	295,012	305,177	307,763	317,772
Margin %	*17%*	*33%*	*32%*	*31%*	*31%*

Scenario 2: Voice and Data

Table 17: MNO selling Voice and Data services

EBITDA Margins	FY08E	FY09E	FY10E	FY11E	FY12E
Revenues ('000)					
Voice	$579,113	$889,593	$953,917	$987,557	$1,008,929
Data	$116,640	$172,538	$200,707	$207,785	$201,109
WiMax	$0	$0	$0	$0	$0
Total	**$695,753**	**$1,062,131**	**$1,154,624**	**$1,195,342**	**$1,210,039**
COGS ('000)					
Acquisition Costs					
Voice + Data	$129,600	$121,176	$113,300	$112,167	$117,214
Wimax	$0	$0	$0	$0	$0
Acquisition Commissions					
Voice + Data	$107,243	$80,463	$56,742	$45,961	$41,479
Wimax	$0	$0	$0	$0	$0
Revenue Sharing	$21	$32	$35	$36	$36
Total	**$236,864**	**$201,671**	**$170,076**	**$158,163**	**$158,730**
Gross Profit	**$458,889**	**$860,460**	**$984,548**	**$1,037,179**	**$1,051,309**
Margins %	*66%*	*81%*	*85%*	*87%*	*87%*
OpEx ('000)					
Usage Commission					
Voice + Data	$9,652	$7,242	$5,107	$4,136	$3,733
Wimax	$0	$0	$0	$0	$0
All other OpEx	$233,280	$385,673	$473,564	$517,501	$528,701
Total	**$242,932**	**$392,915**	**$478,670**	**$521,638**	**$532,434**
EBITDA	215,957	467,544	505,878	515,542	518,875
Margin %	*31%*	*44%*	*44%*	*43%*	*43%*

Scenario 3: Voice, Data and WiMax

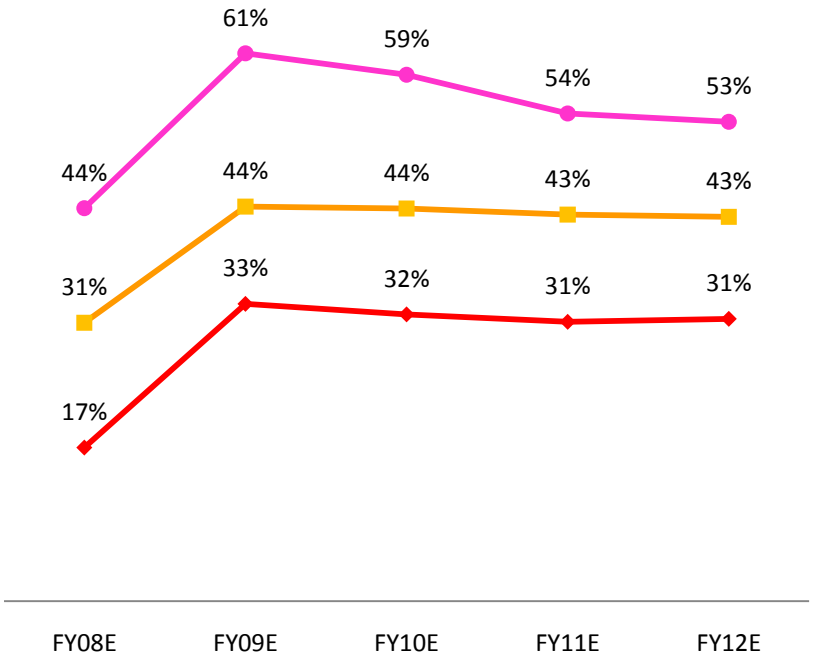
Table 18: MNO selling Voice Data and WiMax

EBITDA Margins	FY08E	FY09E	FY10E	FY11E	FY12E
Revenues ('000)					
Voice	$579,113	$889,593	$953,917	$987,557	$1,008,929
Data	$116,640	$172,538	$200,707	$207,785	$201,109
WiMax	$1,659,398	$3,154,795	$2,957,526	$2,996,047	$3,299,089
Total	**$2,355,151**	**$4,216,926**	**$4,112,150**	**$4,191,389**	**$4,509,128**
COGS ('000)					
Acquisition Costs					
Voice + Data	$129,600	$121,176	$113,300	$112,167	$117,214
Wimax	$432,000	$495,720	$505,634	$614,346	$700,354
Acquisition Commissions					
Voice + Data	$107,243	$80,463	$56,742	$45,961	$41,479
Wimax	$285,120	$308,999	$280,159	$310,136	$337,841
Revenue Sharing	$71	$127	$123	$126	$135
Total	**$954,034**	**$1,006,485**	**$955,958**	**$1,082,735**	**$1,197,024**
Gross Profit	**$1,401,118**	**$3,210,441**	**$3,156,193**	**$3,108,655**	**$3,312,103**
Margins %	*59%*	*76%*	*77%*	*74%*	*73%*
OpEx ('000)					
Usage Commission					
Voice + Data	$9,652	$7,242	$5,107	$4,136	$3,733
Wimax	$25,661	$27,810	$25,214	$27,912	$30,406
All other OpEx	$333,850	$599,367	$711,457	$796,699	$868,313
Total	**$369,162**	**$634,419**	**$741,778**	**$828,748**	**$902,452**
EBITDA	1,031,955	2,576,022	2,414,414	2,279,907	2,409,652
Margin %	*44%*	*61%*	*59%*	*54%*	*53%*

Conclusion

The graphical view of EBITDA margins calculated for the three scenarios makes it a simple case to present. In order to make the most of the increasing subscriber base; MNOs need to sell more products and reap more benefits before market dynamics make higher margins unachievable. For example, just as cheaper handsets affected connection prices, WiMax equipment will bring down WiMax prices and thus the margins.

Figure 23: Scenarios compared on the basis of EBITDA Margins

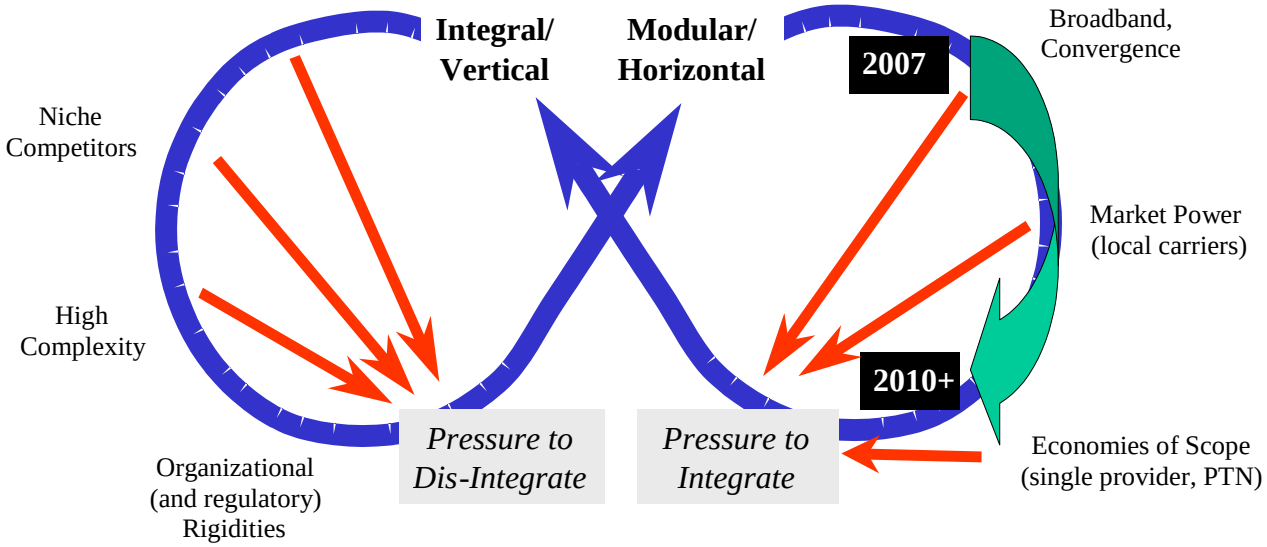


Through WiMax Mobile network operators will be able to provide Triple Play which includes all three Voice, Data and Video communication services. WiMax will thus present the total telecommunication solution and help an operator become a one stop shop for all its subscriber's communication needs by becoming the total telecom provider. WiMax being a new state of the art technology the operator would be able to earn abnormal profits initially exactly like GSM/Mobile Voice services did three years back. Then eventually revenues will stabilize but all in all would still be higher than what MNOs can earn on mobile voice and data services only.

9 FUTURE OUTLOOK

The pace of telecommunications development has become so rapid that each day multiple headlines announcing mergers, divestitures or new technologies hit headlines around the globe. Predicting where the Pakistani industry will go in the future is rather difficult. The double helix model proposed by C. Fine in Clockspeed tends to suggest that the market is moving towards integration. (The Fine Helix):

Figure 24: Fine's Double Helix, showing pressure to integrate in service provision



The figure shows how the requirement to provide a wide range of services, market power of the largest firms (Mobilink and Warid/Wateen), and economies of scope and scale have moved the service provider industry along the right side of the double helix. Additional factors supporting this stance trend are the need for a dominant communication protocol and the high cost of capital required to maintain the telecommunications infrastructure. On the other hand, the forces of diversification may be more powerful, keeping us in a horizontal structure. This view proposes that the pace of the industry is so fast, large consolidated companies will not be agile enough to compete so we will tend to see more focused, specialized players. The development of open standards will help maintain this modular structure. The extent of government intervention will play a key role in determining what the ultimate structure will be.

The prediction thus can be that two or three large, vertically-integrated companies will dominate the industry.

These large, vertically integrated companies will form the backbone of the telecommunications network. They will have the resources – and the market power – to bring together all of the myriad of players in the industry and force feasible solutions to the technological challenges of the future. An interesting and very recent validation of this view was the recent lecture at MIT by the Chairman and CEO of Lucent Technologies, Richard McGinn. Based on developments that are just emerging in optical technologies, there will be four essential players in the "last mile" market:

- HFC (Hybrid fiber / cable coaxial) networks
- Fiber-optic networks
- Wireless local networks (e.g. MMDS – Multipoint Multichannel Distribution Services)
- Free Space laser networks (point-to-point optical transmission)

The market opportunity for regional carriers is that of all these competing technologies, only fiber-optic cable strung to the neighborhood (or house) will provide the requisite amount of bandwidth. In addition, the fiber network is the only real "long haul" network; the other three technologies require use of the fiber network. A phone call between two wireless users, for example, must at some point utilize the local carrier to connect the two cells. Using the "Information Superhighway" analogy, it could be said that you "can't get from here to there on the back roads:" you have to get on the interstate. Attached to this main fiber-optic backbone, however, will be many smaller niche competitors operating in a more modular/horizontal structure, using the types of technologies mentioned above. .The externalities of this type of industry structure – a large and vertically integrated backbone, with many smaller offerings that rely on it for their service provision – provide market power and revenue opportunities for the few players that become big enough to control the network.

Works Cited

Bhatti, B. (2007, April 10). Guide to MNP in Pakistan.

Bhatti, B. (2007, October 26). Korea's SK Telecom Buys Instaphone .

Bhatti, B. (2007, September 10). Overview of WiMax in Pakistan.

Tahir, A. (2007, August 7). MNP in Pakistan: Business & Consumer Perspective.

Appendix

Industry Data – 2007

Pakistan Mobile Subscribers

Wireless market ('000)	Jan-07	Feb-07	Mar-07	Apr-07	May-07	Jun-07	Jul-07	Aug-07	Sep-07
Population ('000)	165,128	165,128	165,128	165,128	165,128	165,128	165128	165128	165128
% Change	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*
Wireless subscribers (000)									
% Change									
Population penetration	**30.7%**	**32.1%**	**33.7%**	**35.4%**	**36.9%**	**38.3%**	**39.8%**	**41.2%**	**42.4%**
Net additions (000)	2,394	2,201	2,732	2,828	2,459	2,285	2,463	2,352	2,007
% Change	*28%*	*-8%*	*24%*	*4%*	*-13%*	*-7%*	*8%*	*-5%*	*-15%*
Subscribers by operator ('000)									
Paktel (GSM)	1,055	1,031	1,033	1,027	1,055	1,025	1,026	1,035	1,233
Pakcom (Instaphone)	320	315	311	327	327	333	336	336	337
PMCL (Mobilink)	23,229	23,882	24,649	25,213	25,795	26,466	27,166	27,830	28,572
PTML (Ufone)	10,557	10,886	11,597	12,489	13,318	14,014	14,773	15,337	15,423
Telenor	7,607	8,345	9,071	9,675	10,134	10,731	11,272	11,982	12,579
Warid	7,916	8,426	8,956	9,714	10,275	10,620	11,079	11,484	11,867
SCO*	50	50	50	50	50	50	50	50	50
Total	**50,734**	**52,935**	**55,667**	**58,495**	**60,954**	**63,239**	**65,702**	**68,054**	**70,061**
Subscriber market share									
Paktel (GSM)	2%	2%	2%	2%	2%	2%	2%	2%	2%
Pakcom (Instaphone)	1%	1%	1%	1%	1%	1%	1%	0%	0%
PMCL (Mobilink)	46%	45.1%	44.3%	43.1%	42.3%	41.9%	41.3%	40.9%	40.8%
PTML (Ufone)	20.8%	20.6%	20.8%	21.4%	21.8%	22.2%	22.5%	22.5%	22.0%
Telenor	15.0%	15.8%	16.3%	16.5%	16.6%	17.0%	17.2%	17.6%	18.0%
Warid	15.6%	15.9%	16.1%	16.6%	16.9%	16.8%	16.9%	16.9%	16.9%
SCO*	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0%	0%	0%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	100%	100%	100%
Monthly net adds (000)									
Paktel (GSM)	(273)	(24)	2	(6)	28	(30)	1	9	198
Pakcom (Instaphone)	(10)	(5)	(4)	16	0	6	3	0	1
PMCL (Mobilink)	854	653	767	564	582	671	700	664	742
PTML (Ufone)	540	329	711	892	829	696	759	564	86
Telenor	982	738	726	604	459	597	541	710	597

Warid	301	510	530	758	561	345	459	405	383
SCO*	-	-	-	-	-	-	-	-	-
Total	**2,394**	**2,201**	**2,732**	**2,828**	**2,459**	**2,285**	**2,463**	**2,352**	**2,007**
Net adds market share									
Paktel (GSM)	-11%	-1%	0%	0%	1%	-1%	0%	0%	10%
Pakcom (Instaphone)	0%	0%	0%	1%	0%	0%	0%	0%	0%
PMCL (Mobilink)	36%	30%	28%	20%	24%	29%	28%	28%	37%
PTML (Ufone)	23%	15%	26%	32%	34%	30%	31%	24%	4%
Telenor	41%	34%	27%	21%	19%	26%	22%	30%	30%
Warid	13%	23%	19%	27%	23%	15%	19%	17%	19%
SCO*	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Industry Data - 2006

Pakistan Mobile Subscribers						
Wireless market ('000)	**Jul-06**	**Agu-06**	**Sep-06**	**Oct-06**	**Nov-06**	**Dec-06**
Population ('000)	165,128	165,128	165,128	165,128	165,128	165,128
% Change	*2%*	*0%*	*0%*	*0%*	*0%*	*0%*
Wireless subscribers (000)						
% Change						
Population penetration	**22.3%**	**23.8%**	**25.1%**	**26.9%**	**28.1%**	**29.3%**
Net additions (000)	2,583	2,406	2,240	2,926	2,074	1,864
% Change	*3%*	*-7%*	*-7%*	*31%*	*-29%*	*-10%*
Subscribers by operator ('000)						
Paktel (GSM)	1,122	1,449	1,507	1,557	1,385	1,328
Pakcom (Instaphone)	316	302	285	262	250	330
PMCL (Mobilink)	18,322	19,182	20,240	21,273	22,034	22,375
PTML (Ufone)	7,885	8,357	8,860	9,033	9,647	10,017
Telenor	3,888	4,263	4,597	5,173	5,833	6,625
Warid	5,247	5,633	5,937	7,054	7,277	7,615
SCO*	50	50	50	50	50	50
Total	**36,830**	**39,236**	**41,476**	**44,402**	**46,476**	**48,340**
Subscriber market share						
Paktel (GSM)	3%	4%	4%	4%	3%	3%
Pakcom (Instaphone)	1%	1%	1%	1%	1%	1%
PMCL (Mobilink)	50%	49%	49%	48%	47.4%	46.3%
PTML (Ufone)	21.4%	21.3%	21.4%	20.3%	20.8%	20.7%
Telenor	10.6%	10.9%	11.1%	11.7%	12.6%	13.7%
Warid	14.2%	14.4%	14.3%	15.9%	15.7%	15.8%
SCO*	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Monthly net adds (000)						
Paktel (GSM)	(29)	327	58	50	(172)	(57)
Pakcom (Instaphone)	(77)	(14)	(17)	(23)	(12)	80
PMCL (Mobilink)	1,190	860	1,058	1,033	761	341
PTML (Ufone)	317	472	503	173	614	370
Telenor	432	375	334	576	660	792
Warid	919	386	304	1,117	223	338
SCO*	-	-	-	-	-	-
Total	**2,752**	**2,406**	**2,240**	**2,926**	**2,074**	**1,864**
Net adds market share						
Paktel (GSM)	-1%	14%	3%	2%	-8%	-3%
Pakcom (Instaphone)	-3%	-1%	-1%	-1%	-1%	4%

PMCL (Mobilink)	43%	36%	47%	35%	37%	18%
PTML (Ufone)	12%	20%	22%	6%	30%	20%
Telenor	16%	16%	15%	20%	32%	42%
Warid	33%	16%	14%	38%	11%	18%
SCO*	0%	0%	0%	0%	0%	0%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**