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# Determining International Bandwidth Tariffs in Pakistan

## A Case Study

Aasif Inam  
Pakistan Telecommunication Authority

# Legislative Framework

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- Pakistan Telecommunication (Re-organization) Act 2006
- Broadband Policy 2004
- Pakistan Telecommunication Rules 2000
- Fixed-line Tariff Regulations 2004

# Broadband Policy 2004

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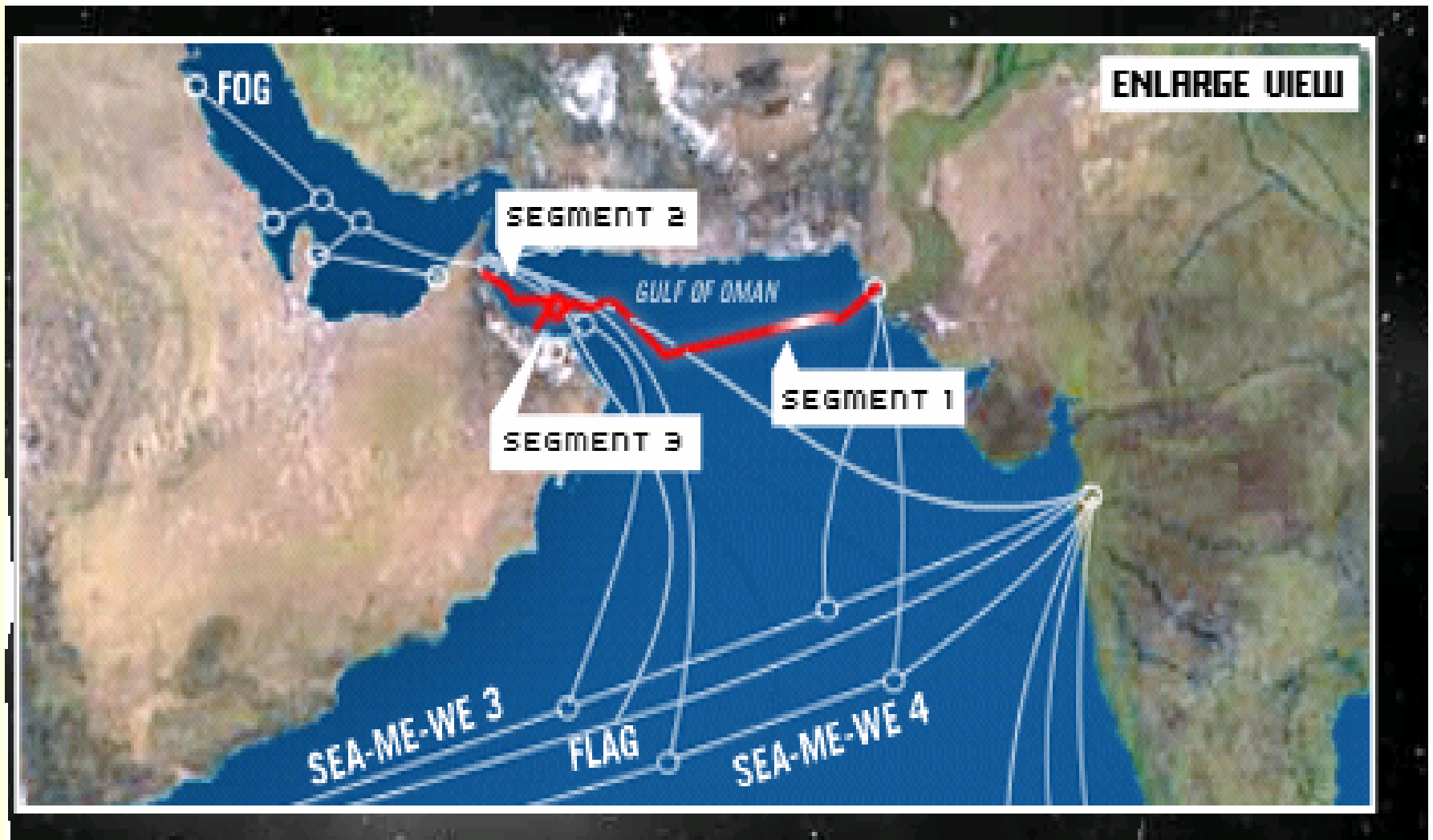
- International IP Bandwidth price is a significant factor in an ISP's cost.
- Reducing Int'l IP bandwidth tariffs will enable ISPs to offer better dial up and broadband services at affordable prices.
- With the increased number of LDI service providers and increased competition in the infrastructure available, it is expected that prices of Int'l IP b/w would reduce.

# Market Overview of Int'l Bandwidth

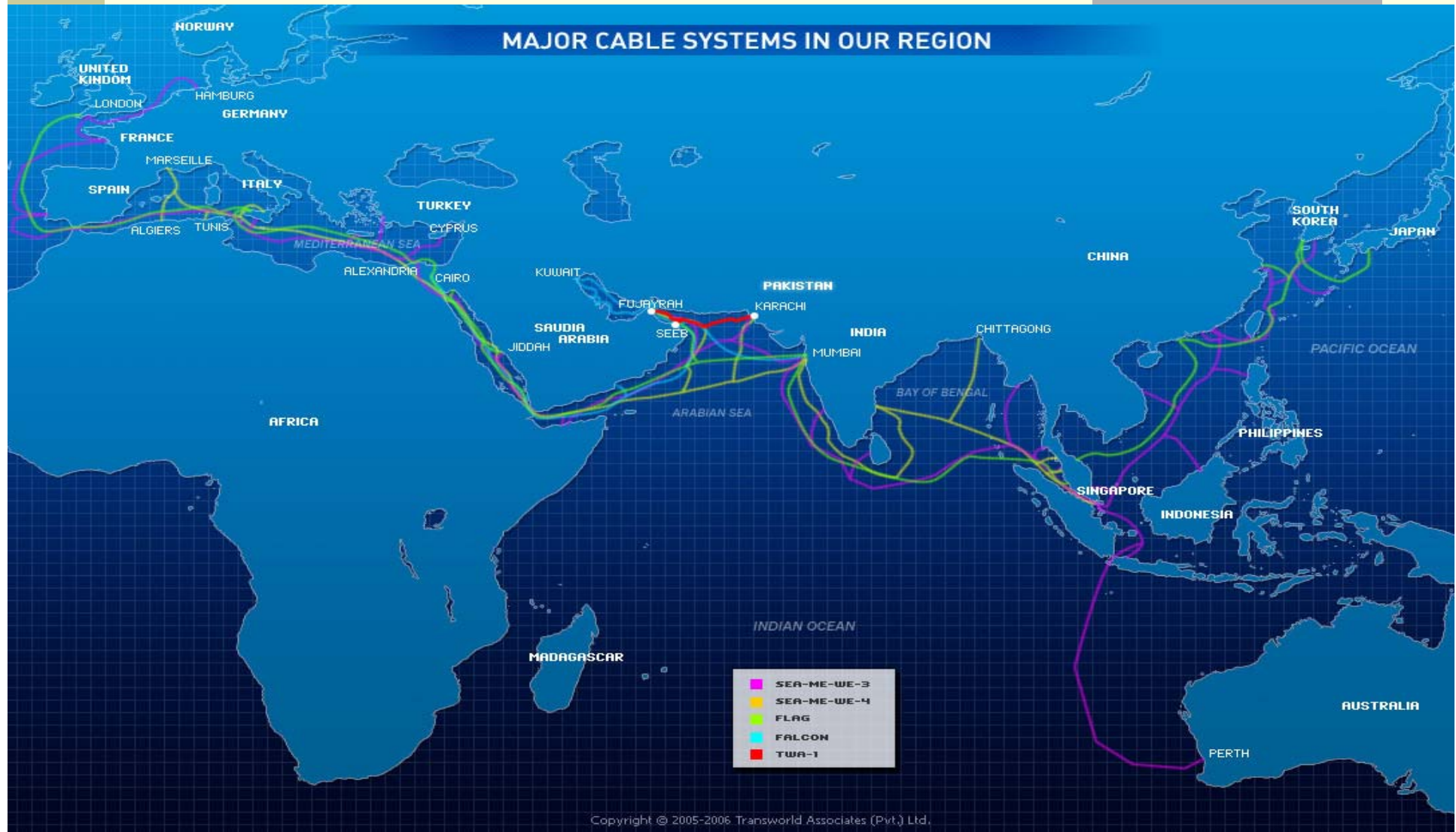
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- At present, there are only two players which are providing Int'l Bandwidth services:
  - Pakistan Telecommunication Company Ltd.
  - Transworld Int'l Associates Pvt. Ltd.
  
- Upcoming bandwidth providers
  - Multinet (through IRU on SEA-MEA-WE-4)
  - Wateen Telecom
  
- PTCL, being an incumbent operator holds dominance in provision of Int'l bandwidth

# Maps for SEA ME WE – 3 & 4 TWA - Map



# Maps for SEA ME WE – 3 & 4 TWA

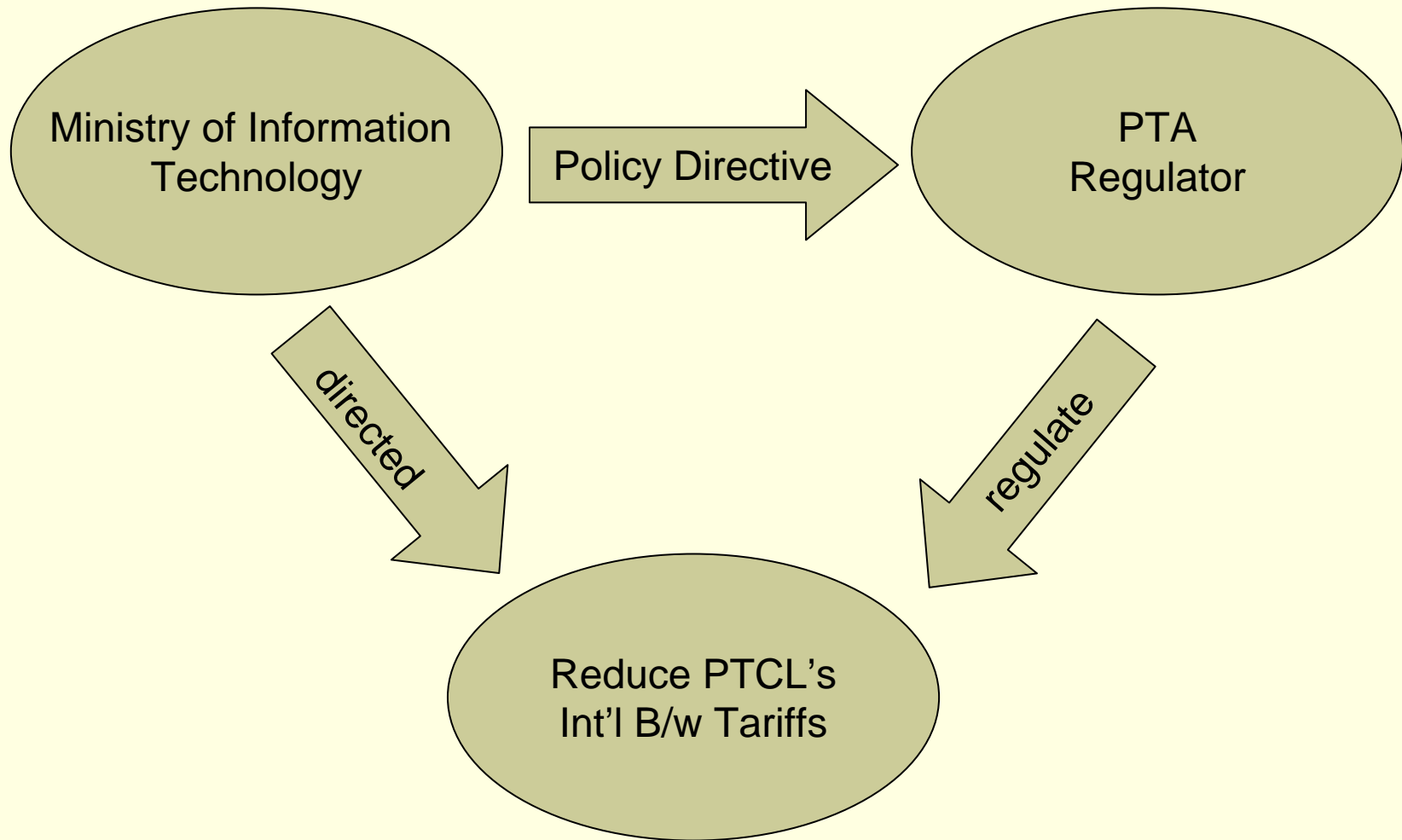


# Need for Regulation

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- Internet Service Providers Association of Pakistan (ISPAK) approached PTA and informed that bandwidth tariffs charged by PTCL are exorbitant and therefore require regulator's intervention.
- In addition, a group of investors met the President of Pakistan and contested that the tariff structure of PTCL is discouraging foreign investors to invest in IT Enabled Services in Pakistan.

# Initiation of Directives – Post Privatization of PTCL - 2006





# Deregulation of Pakistan's Telecom Market

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- Pakistan Telecommunication sector was liberalized in 2003 with the award of new local loop, long distance international and cellular mobile licenses in 2004
- PTA prioritized its focus on ensuring:
  - Smooth Implementation of deregulation and Post deregulation activities
  - Licensing
  - Interconnection
  - Competition
- PTCL was privatized in mid 2006 and management control was handed over to Etisalat UAE

# PTCL's Bandwidth Prices (Half Circuit)

- PTCL, on its own or under instructions from its Ministry reduced prices of bandwidth.
- Authority's focus remained more towards setting the Domestic Leased Line Circuit Tariffs

Date	Int'l B/w Charges US \$	%
01-07-98	56,333	
01-07-99	47,883	15
01-01-00	32,325	32
01-05-00	20,000	38
01-09-00	15,000	25
June 02	6,000	60
Aug. 04	3,950	34
July 06	3,000	24

Source: PTCL

# Consultation Process

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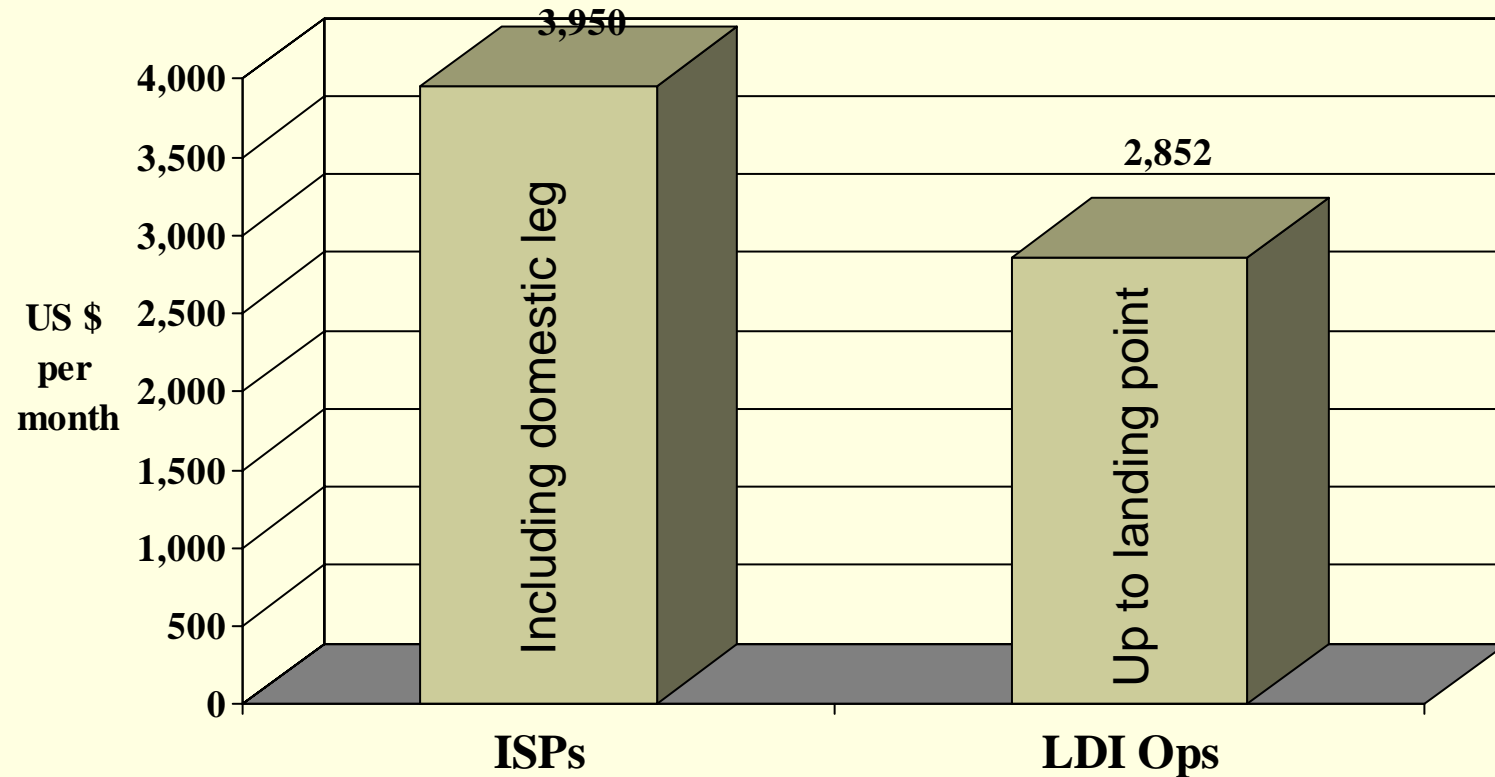
- PTA initiated consultation process on Int'l Bandwidth in May 2006
- Following countries were referred in order to examine regulatory practices:
  - India
  - Japan & South Korea
  - Singapore & Hong Kong
- It was observed that there had been major decline in the cost of building submarine cables

# Issues / Anomalies in Int'l B/w Tariffs

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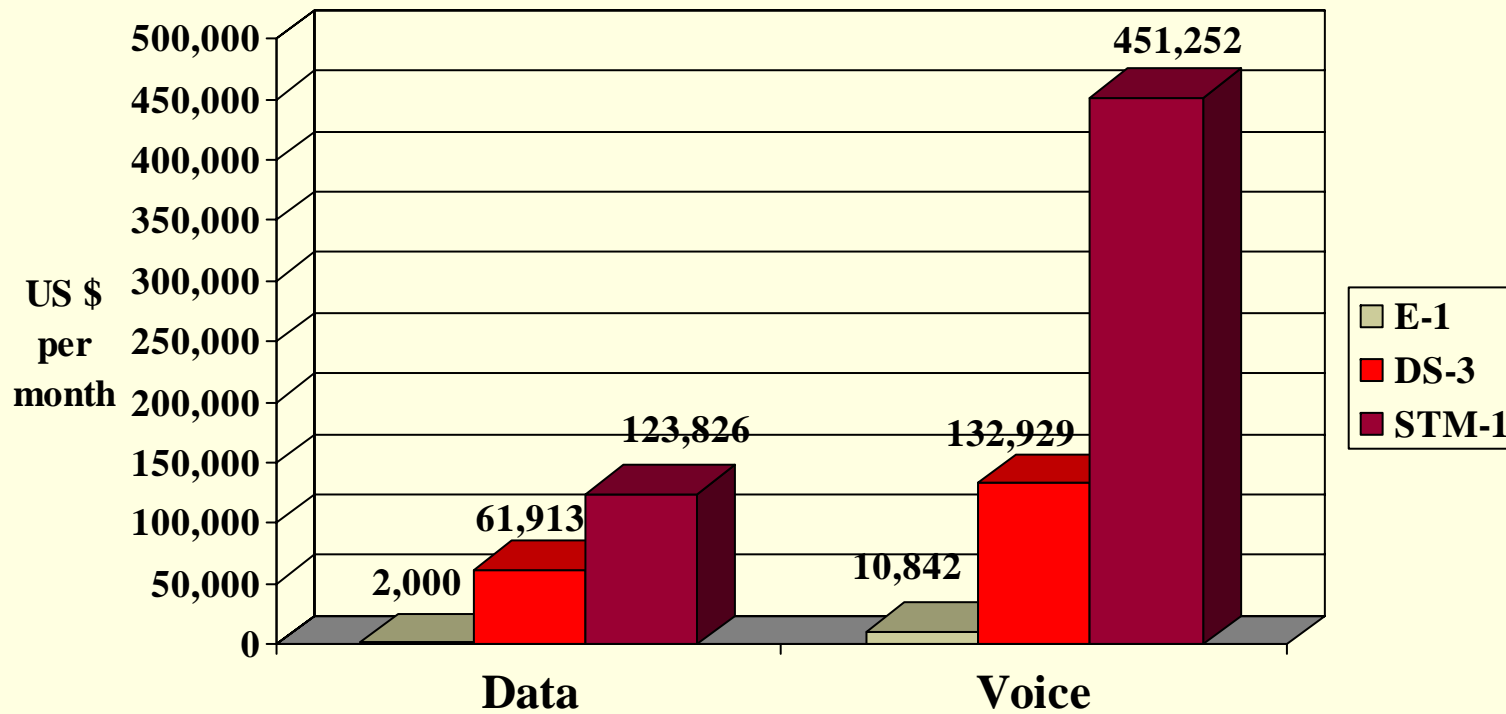
- PTCL had segmented its bandwidth tariffs in terms of voice and data services
- PTCL IPLC tariffs for data included domestic leg charges (i.e. DPLC charges) and thus IPLC was available in major cities of the country at the same tariffs whereas PTCL's IPLC tariffs for voice services were based up to landing point.
- Regional countries were not differentiating in terms of data and voice services.
- The regional countries were observed to be charging IPLC tariffs up to landing points Thus, it was difficult to compare PTCL's IPLC tariffs with regional countries.
- PTCL's price multiples for IPLC for data services (E1:DS3:STM1) were 1:14:47 which were substantially higher than competitive International benchmarks

# Comparison of Half Circuit IPLC (Data & Voice Service) Tariffs for E-1 Capacity



Source: PTCL

# Comparison of IP (Data & Voice Service) Tariffs



Source: PTCL

# Segregation of IPLC from DPLC

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- PTCL was also asked to provide basis and details of the formula for calculating IPLC tariffs for ISPs/Data Service Operators i.e. the formula that clearly depicted the basis for allocation of IPLC tariffs up to landing point and DPLC tariffs from landing point to respective destination.
- The required information was not provided by PTCL.
- In the absence of cost data, PTA had little option but to adopt international benchmarking.

# IPLC Tariffs of Regional Countries

US \$ per month

	India	B. Desh	Japan	China	H. Kong	Malaysia	S. Pore	S. Korea
E1	2,119	2,750	1,916	2,300	2,000	1,408	2,750	1,196
DS3	16,956	33,000	8,333	11,500	10,000	16,469	14,166	8,333
STM1	48,750	82,500	16,666	27,416	25,000	40,737	25,000	16,666
Ratio	1:8:23	1:12:30	1:4:8	1:5:12	1:5:11	1:12:29	1:5:11	1:4:8

Source: Telegeography & PTA Research



# Questions raised in the Consultation Paper

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- Whether the list of countries selected should be further expanded for benchmarking purposes?
- Should IPLC be priced up to the landing stations in Pakistan? And DPLC charges for local access should be separated from IPLC tariffs?
- The level of tariffs in terms of E-1 capacity as well as price multiples for higher capacities should be reviewed
- Should IPLC tariffs for voice and data services be charged separately? Can different tariffs for IPLC be objectively justified on the basis of costs incurred in providing IPLC for voice and data services?

# Issues Highlighted by the Industry

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- Bandwidth Tariffs are un-regulated. They should be regulated by PTA
- PTCL's IPLC tariffs are not competitive when compared with regional countries
- Multiples of higher capacities of IPLC are inconsistent with international standards
- Tariffs for higher capacities i.e. DS-3 & STM-1 are much higher when compared with regional countries
- Charges of IP and IPLC are exorbitant as compared to Philippines, Argentina and India

# Objections raised by Competitors

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- TWA and Multinet who were in the process of commencing their services objected Authority's initiative to regulate international bandwidth tariffs.
- In their opinion,
  - Int'l bandwidth was no longer a monopoly. Hence, there was no need for tariff regulation by the Authority.
  - Market forces should be allowed to determine tariffs and price multiples in Pakistan.
  - Competition in international bandwidth would automatically reduce tariffs.

# Responses from Industry

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- There was no need to enhance list of countries selected for benchmarking
- Industry was divided on the issue of separating DPLC segment from IPLC. Bandwidth providers were of the opinion that it should be separated as DPLC has separate cost components.
- On the contrary, ISPs argued that the overall price of IPLC (whether bundled or unbundled) should be reduced.
- Operators except for competitors were of the opinion that the price multiples for higher capacities should be reduced.

# PTCL's Concerns on the Consultation Paper

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- PTA is not entitled to compare PTCL bandwidth tariffs on the basis of international benchmarks due to the following reasons:
  - The primary obligation of PTA is to set tariffs on cost based which has not been met.
  - PTA has not specified basis of determining the cost and has not provided costing methodology.
  - Benchmarking has not been supported by complete contextual analysis relating to product types, supply and demand, total telephony demand, geography and GDP etc.

# PTCL's Concerns on the Consultation Paper

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- Choice of countries used for benchmarking has to comply with the following.
  - Rule 16(4) of Pakistan Telecom Rules 2000 require these to be “**similar services provided by telecommunication operators in other countries providing comparable telecommunication services to those of the SMP operator**”
  - Regulation 11 of Fixed-line Tariff Regulations 2004 require “*the international benchmarks to be from “**comparable countries**”*”

# PTCL's Concerns on the Consultation Paper

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- International comparisons are not 'apple to apple' because:
  - Fiscal policies, incentives and subsidies are not the same
  - PTCL is offering distance-less tariffs while these are distance based tariffs. The cost would increase with distance from the landing station inwards.
  - Developed economies not comparable countries as they are more competitive and have more cable providers.
  
- PTCL proposed to use Digital Access Index, devised by ITU in 2002.

# Addressing PTCL's Concerns

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- The provision of Telecom Deregulation Policy required PTA to maintain an effective and well defined regulatory regime that is consistent with International Best Practices.
- Regulatory bodies through out the world issue consultation papers for soliciting opinion of stakeholders before issuing final orders. PTA also followed the same practice.



# Addressing PTCL's Concerns

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- PTCL's objection to determine Int'l bandwidth tariffs on the basis of Int'l Benchmarks was repelled due to following reasons:
  - As PTCL failed to provide cost information to PTA, thus PTA is justified to use benchmarks for determining PTCL's bandwidth tariffs.
  - PTA also set mobile termination rates based on the cost studies submitted by mobile operators themselves. PTCL was also involved during the consultation process and did not mention any reservation to the Authority.
- Some of the countries considered by PTA were also used by the Govt. of Pakistan in its broadband policy while making internet and broadband comparison. Hence, the choice of countries was consistent with the benchmarking done by GoP.

# Consultancy on Cost-Based Charges

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- PTA has awarded consultancy on Cost based fixed & mobile interconnection charges to Ovum Consulting.
- Ovum will also determine IPLC tariffs based on cost as well on benchmarking.
- Until determination of cost, PTA determined IPLC tariffs based on International Benchmarks

# Benchmarking

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- The purpose of benchmarking is to make comparison with other countries where a service is provided at a competitive level.
- Since every country has its own unique features - Not possible to base benchmarking process for all issues purely on telecommunication related
  - geographical,
  - economic and,
  - social indicators
- Ranking based on such indicators generally results in placing Pakistan in those categories where competition has not yet been introduced.
- Thus, reliance on such comparison would not help in improving the rankings in the context of setting international bandwidth tariffs.

# Benchmarking

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- In light of provisions of the Rules, benchmarking should be done where tariffs are cost based so that their tariffs can be considered as proxy figures.
- Based on this principle, PTA determined PTCL's interconnect charges where PTCL itself had benchmarked the rates with developed countries like UK, Malaysia, Australia and Ireland.
- Cost orientation of tariffs can be established either through availability of cost information or through effective competition in the benchmarked countries.

# Benchmarking

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- Level of competition varies from country to country. As also noted by the Gartner Report 2004

*“the most competitive markets for international bandwidth are Hong Kong, Singapore, Japan, Taiwan and South Korea, whereas the least competitive markets are Indonesia, India and Malaysia”*

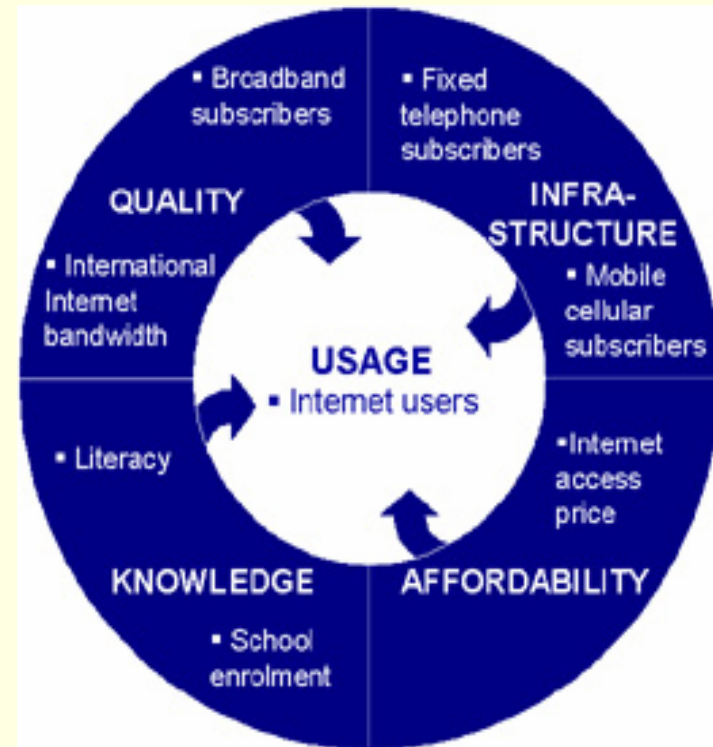
# Benchmarking Methodologies

Name of Index (Organization)	No. of Economies	No. of Indicators	Latest Data	Comments
Digital Opportunity Index (ITU/UNCTAD/KADO)	180	11	2004/05	Three clusters: Utilization, Infrastructure and Opportunity
ICT Opportunity Index (ORBICOM/ITU)	139	17	2003	Compares 'Infostates', 'Infodensity' and 'InfoUse' against an Imaginary economy called 'Hypothetical'
ICT Development Index (UNCSTD)	180	8	2003	Four cluster: Access, Connectivity, Usage and Policy.
Informational Society Index (IDC)	52	15	2004	Only sparse methodological data is disclosed.
E-Readiness Index (EIU/IBM)	68	31	2004/05	Six clusters: Connectivity, Business environment, Adoption, Legal and policy environment, social and cultural environment, supporting e-services. Uses a mix of quantitative and survey data.
Network Readiness Index (InfoDev/WEF/INSEAD)	102	48	2003	Three clusters: Environment, Readiness, Usage. Uses a mix of survey, qualitative and quantitative data.
Digital Access Index (ITU)	179	8	2002	Five clusters: Infrastructure, Affordability, Knowledge, Quality, Usage.
Mobile/Internet Index (ITU)	171	26	2001	Three Clusters: Infrastructure, usage, mkt conditions
Technology Achievement Index (UNDP)	71(full data)	8	1998-2000	Four clusters: Creation of technology, Diffusion of recent Innovations, Diffusion of old Innovations, Human skills.

Source: WISR 06

# Digital Access Index

- Devised by ITU in 2002 for 179 countries
- Measures overall ability of individuals in a country to assess access and use of ICT
- Built around four fundamental factors that impact a country's ability to access ICT
  - Infrastructure
  - Affordability
  - Knowledge
  - Quality



# Digital Access Index

•DAI has classified countries according to

- High
- Upper
- Medium &
- Low ICT Access

• Pakistan was classified with Low ICT Access

• India was classified in the Medium Category

Country	DAI Ranking	DAI Score	Country	DAI Ranking	DAI Score
Morocco	118	0.33	Vanuatu	128	0.24
India	119	0.32	Azerbaijan	128	0.24
Kyrgyzstan	119	0.32	Sao Tome & Principe	131	0.23
Vietnam	121	0.31	Tajikistan	132	0.21
Uzbekistan	121	0.31	Equatorial Guinea	133	0.20
Armenia	123	0.30	Lesotho	134	0.19
Zimbabwe	124	0.29	Kenya	134	0.19
Honduras	124	0.29	Nicaragua	134	0.19
Syria	126	0.28	Nepal	134	0.19
Papua New Guinea	127	0.26	Yemen	138	0.18
<b>Pakistan</b>	<b>128</b>	<b>0.24</b>	Bangladesh	138	0.18



# Network Readiness Index (NRI)

- World Economic Forum has published “Global Information Technology Report 2005-06”.
- NRI covers 115 economies to measure degree of preparation of a nation to participate in and benefit from ICT developments.
- NRI is composed of three indexes which assess
  - Environment of ICT offered by a given country
  - Readiness of a community key stakeholders – individuals, businesses and governments
  - The usage of ICT among these stakeholders

Countries	Score 2005	Rank 2005
Egypt	-0.29	63
Bulgaria	-0.31	64
Uruguay	-0.31	65
Panama	-0.33	66
Pakistan	0.34	67
Indonesia	0.36	68
Costa Rica	0.37	69
Philippines	0.37	70
Argentina	0.38	71
Russia	0.39	72

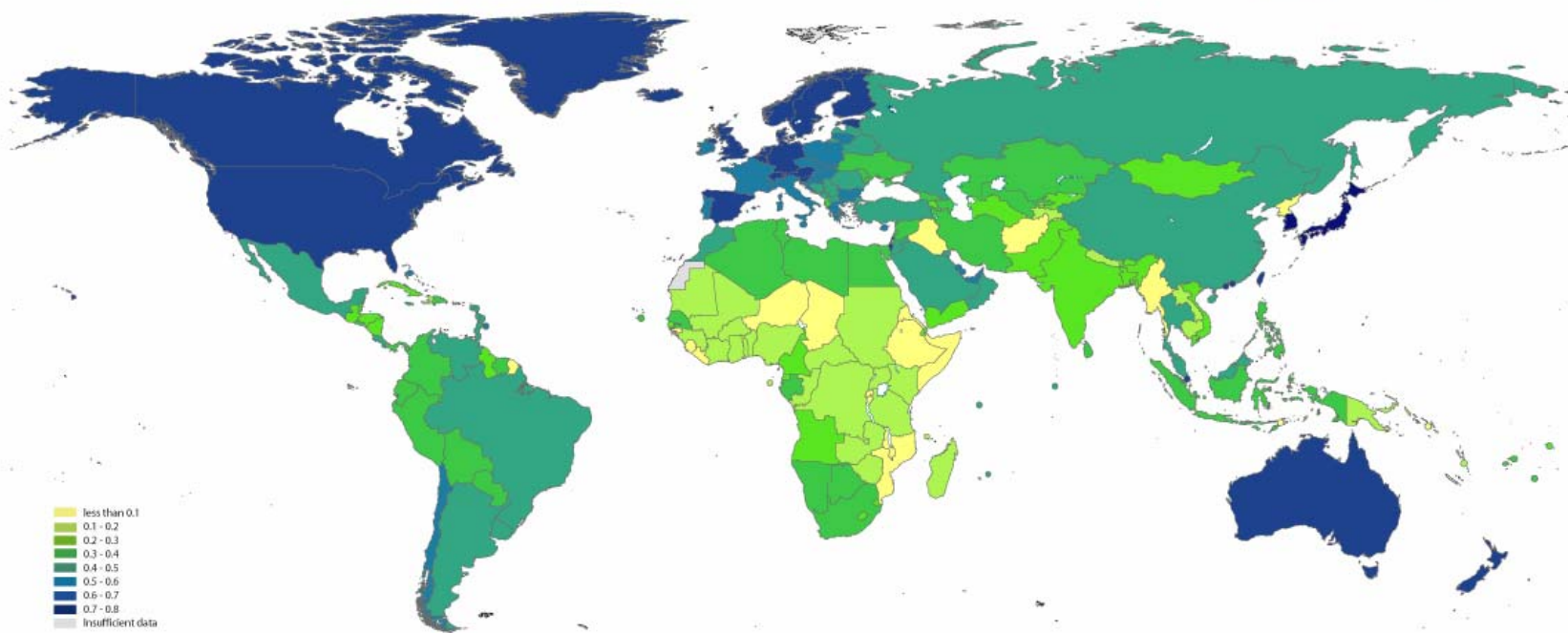
# Digital Opportunity Index (DOI)

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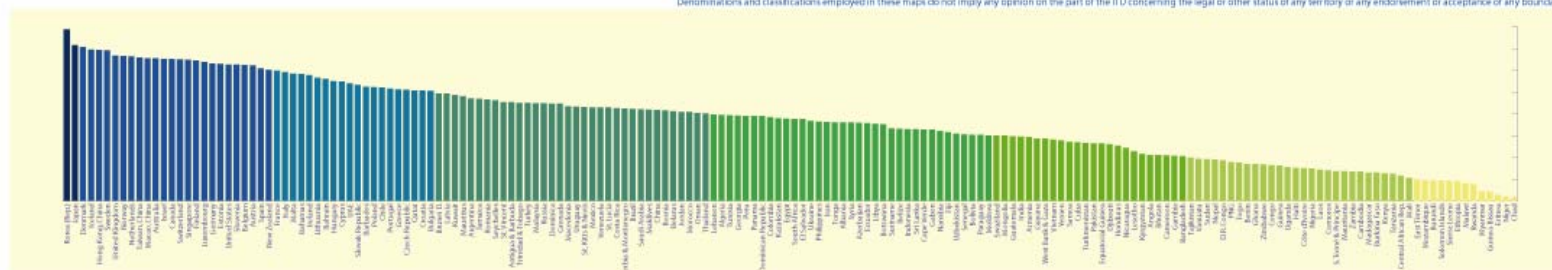
- ITU issued its World Information Society Report 2006 that present Digital Opportunity Index for 2005 as composite index
- Consists of three sub-indices that measure:
  - Opportunity
  - Infrastructure
  - Utilization against an index which can be used to inform and enrich policy making through benchmarking and analysis of performance

# Digital Opportunity Index (DOI)

## The Digital Opportunity Index Worldwide, 2005



Denominations and classifications employed in these maps do not imply any opinion on the part of the ITU concerning the legal or other status of any territory or any endorsement or acceptance of any boundary.



For more information about the Digital Opportunity Index, please see [www.itu.int/doi](http://www.itu.int/doi).

This map is a part of the World Information Society Report 2006, available at [www.itu.int/wisr](http://www.itu.int/wisr).

# Digital Opportunity Index (DOI)

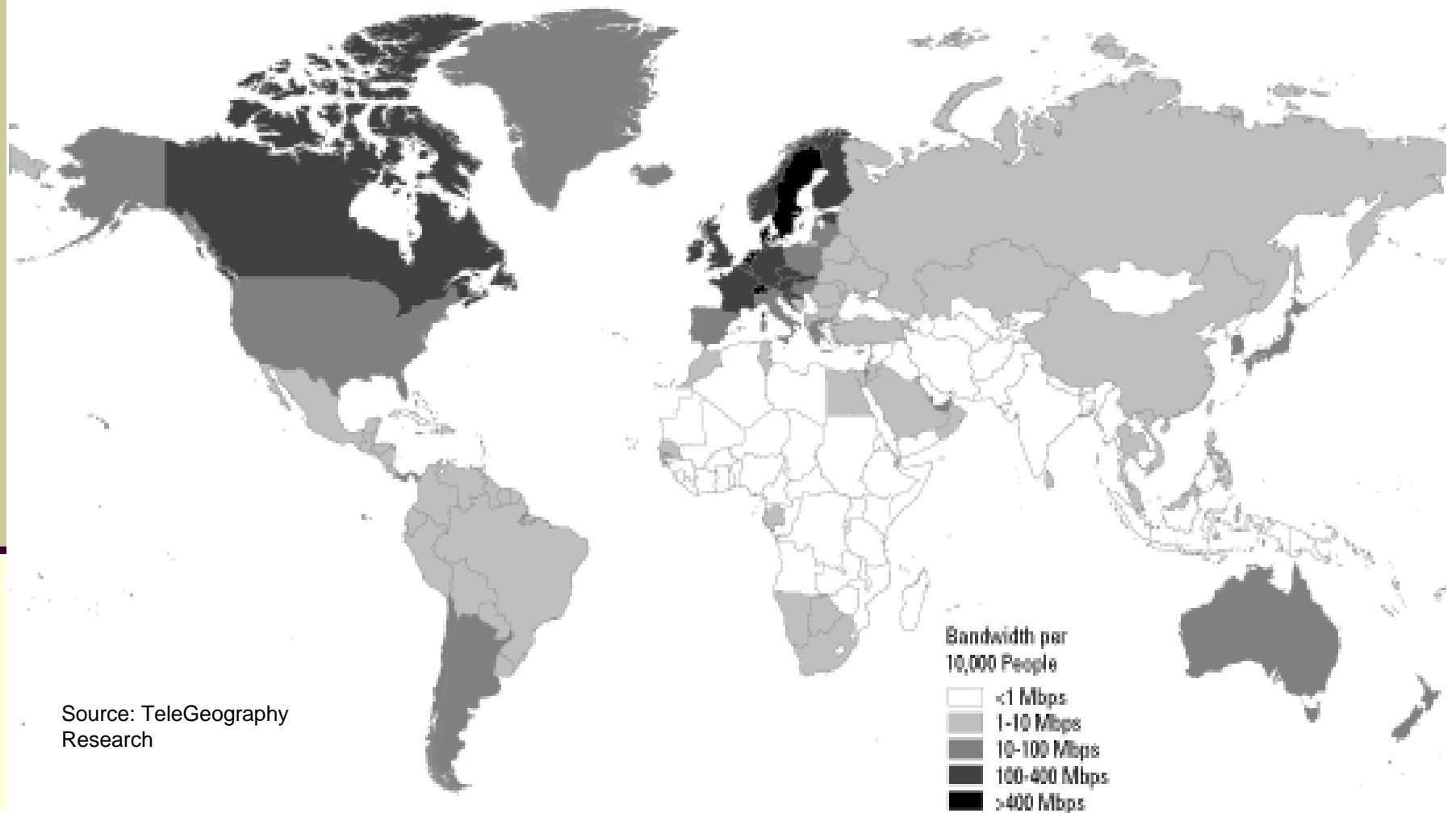
Economy	Opportunity	Infrastructure	Utilization	DOI	World Rank
India	0.8	0.04	0.04	0.29	119
Armenia	0.7	0.15	0.02	0.29	120
Guyana	0.72	0.13	0.01	0.29	121
Palestine	0.63	0.21	0.02	0.29	122
Vietnam	0.76	0.06	0.02	0.28	123
Yemen	0.78	0.06	0	0.28	124
Samoa	0.71	0.09	0.01	0.27	125
Cuba	0.76	0.04	0	0.27	126
Turkmenistan	0.72	0.07	0	0.26	127
<b>Pakistan</b>	<b>0.73</b>	<b>0.05</b>	<b>0</b>	<b>0.26</b>	<b>128</b>
E Guinea	0.73	0.05	0	0.26	129
Djibouti	0.74	0.04	0	0.26	130
Honduras	0.68	0.07	0.01	0.25	131
Nicaragua	0.6	0.07	0.06	0.24	132
Lesotho	0.65	0.03	0	0.23	133
Kyrgyzstan	0.55	0.09	0.01	0.22	134
Angola	0.6	0.02	0	0.21	135
Bhutan	0.59	0.02	0.01	0.21	136
Cameroon	0.59	0.03	0	0.21	137
Gambia	0.53	0.08	0.01	0.21	138
Bangladesh	0.6	0.01	0	0.2	139

# Benchmarking with India

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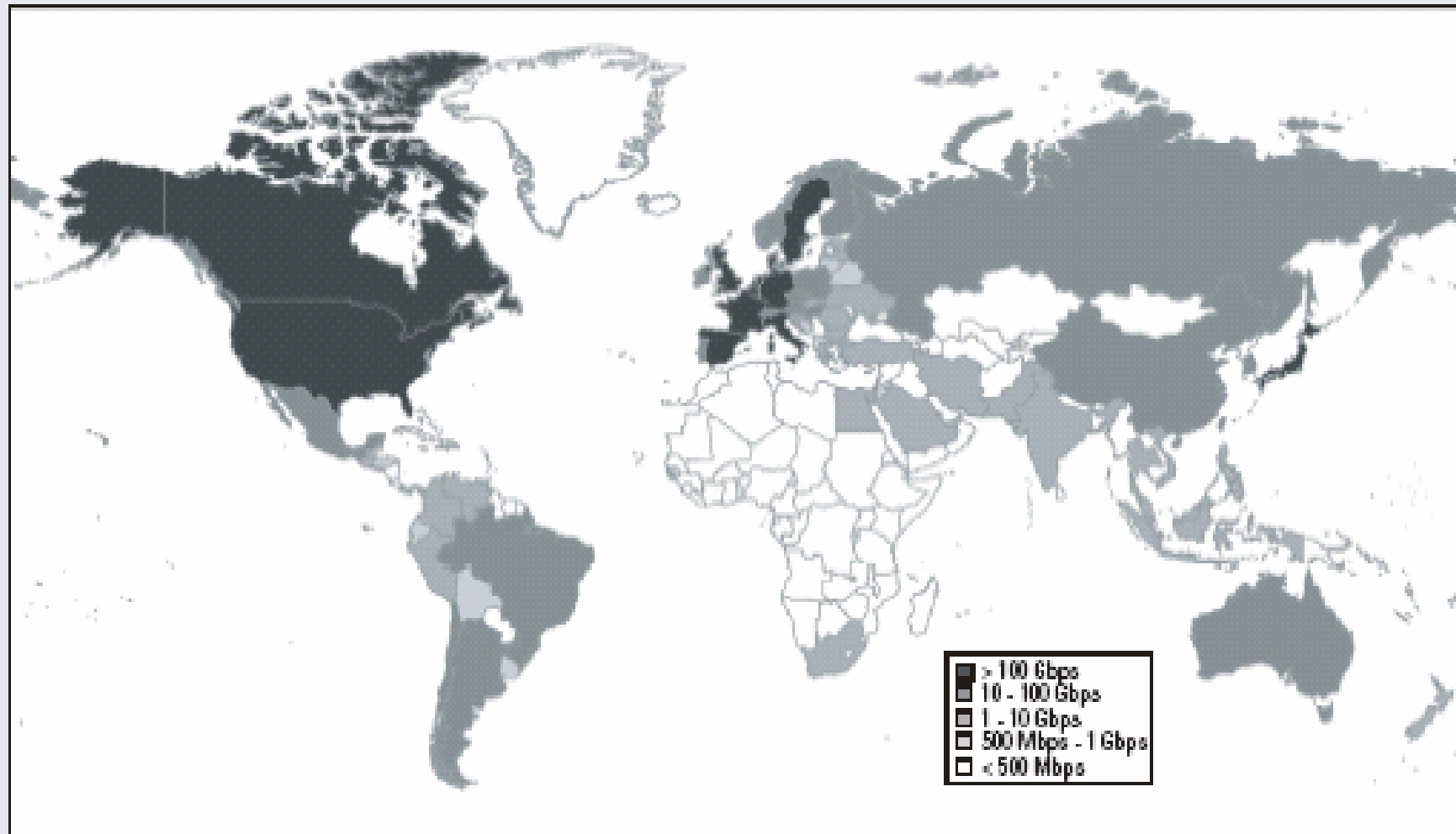
- Benchmarking based on the aforementioned indicators would have led to comparison with peers which would not have helped the Authority to an objective and purposeful comparison.
  
- India became reasonable choice for comparison owing to the following reasons:
  - Better performance in all of the above indices
  - Geographical proximity
  - Similar level of Per Capita GDP
  - Relatively effective competition
  - Same undersea cable networks i.e. SEA-ME-WE 3 & 4

# Map of Int'l Bandwidth Usage per Capita by Country, 2005



Source: TeleGeography Research

# Map of Int'l Bandwidth Usage per Capita by Country, 2004



Source: TeleGeography research

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# Comparative Analysis of PTCL's IPLC Tariffs

Capacity	ISPs		Call Centers		LDI
E1	3,950	3,000	3,500	2,400	2,852
DS3	67,150	48,000	57,150	38,500	-
STM	184,950	112,500	-	90,000	-
Price Multiples	1:14:47	1:16:38	1:16	1:16:38	

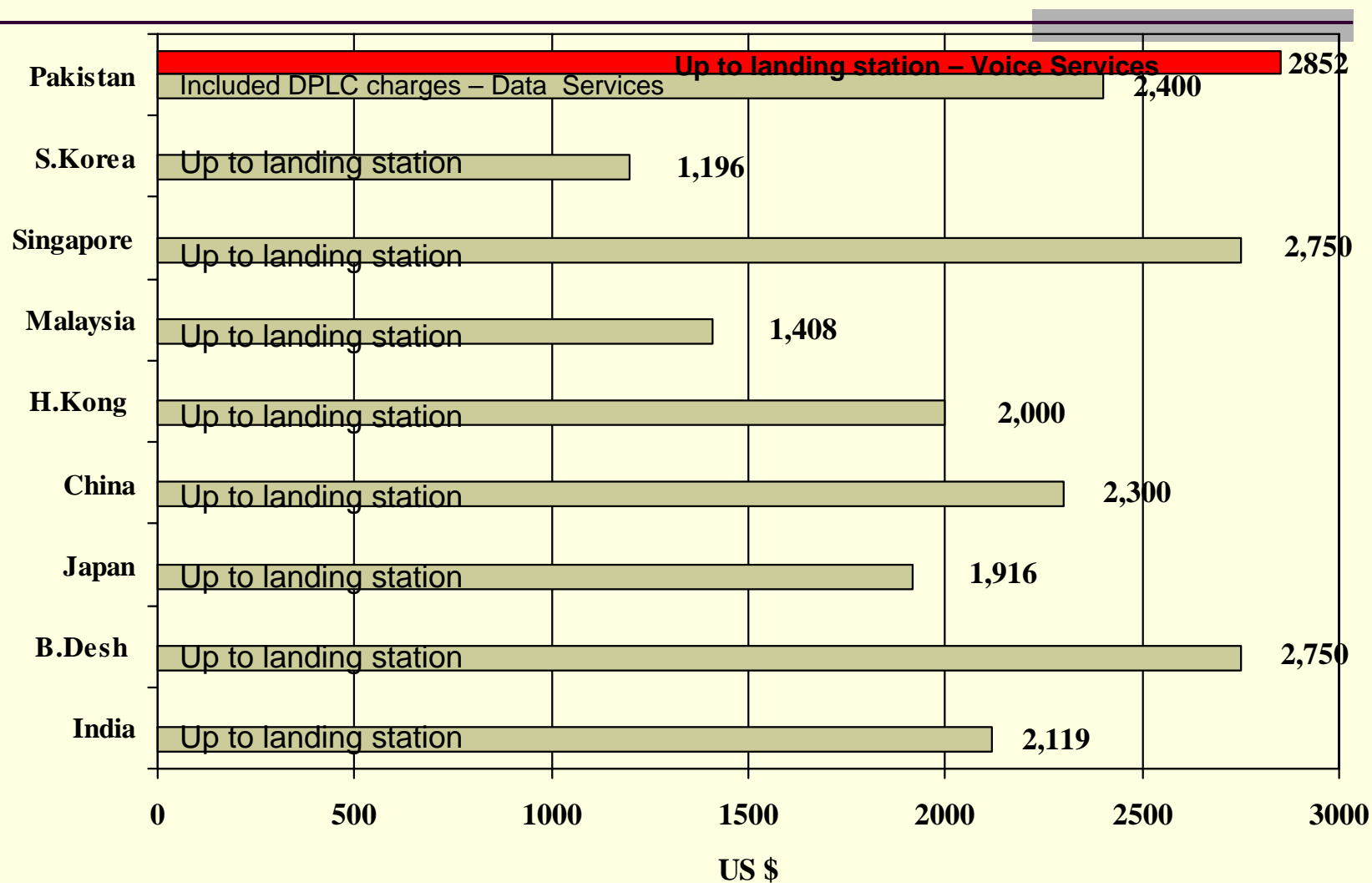
Source: PTCL

Analysis of Global Price Multiples of Competitive Countries

	E1:DS3:STM1
High Price Multiples	1:7:17
Low Price Multiples	1:4:8

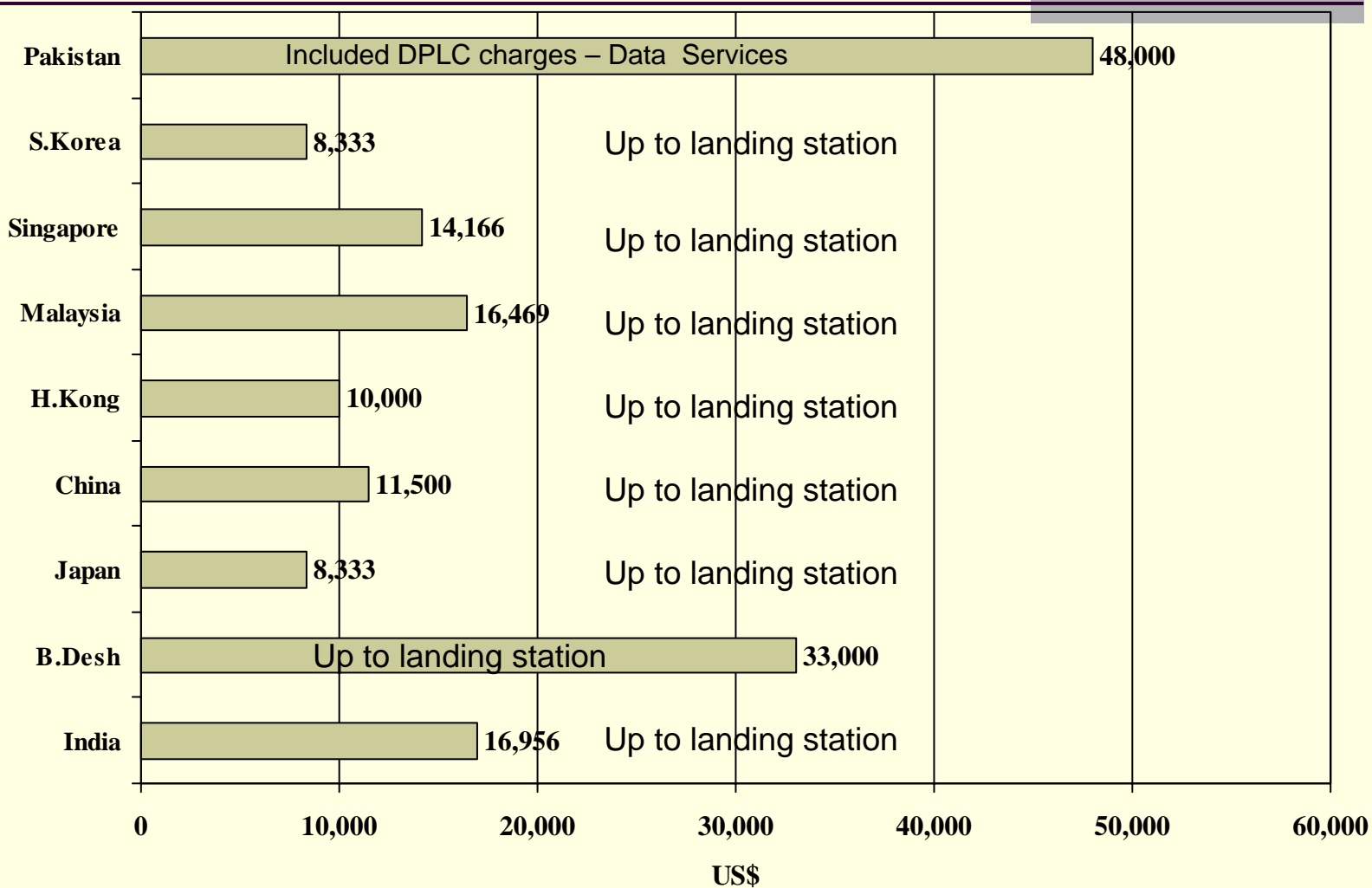


# IPLC Tariffs for E-1 Capacity



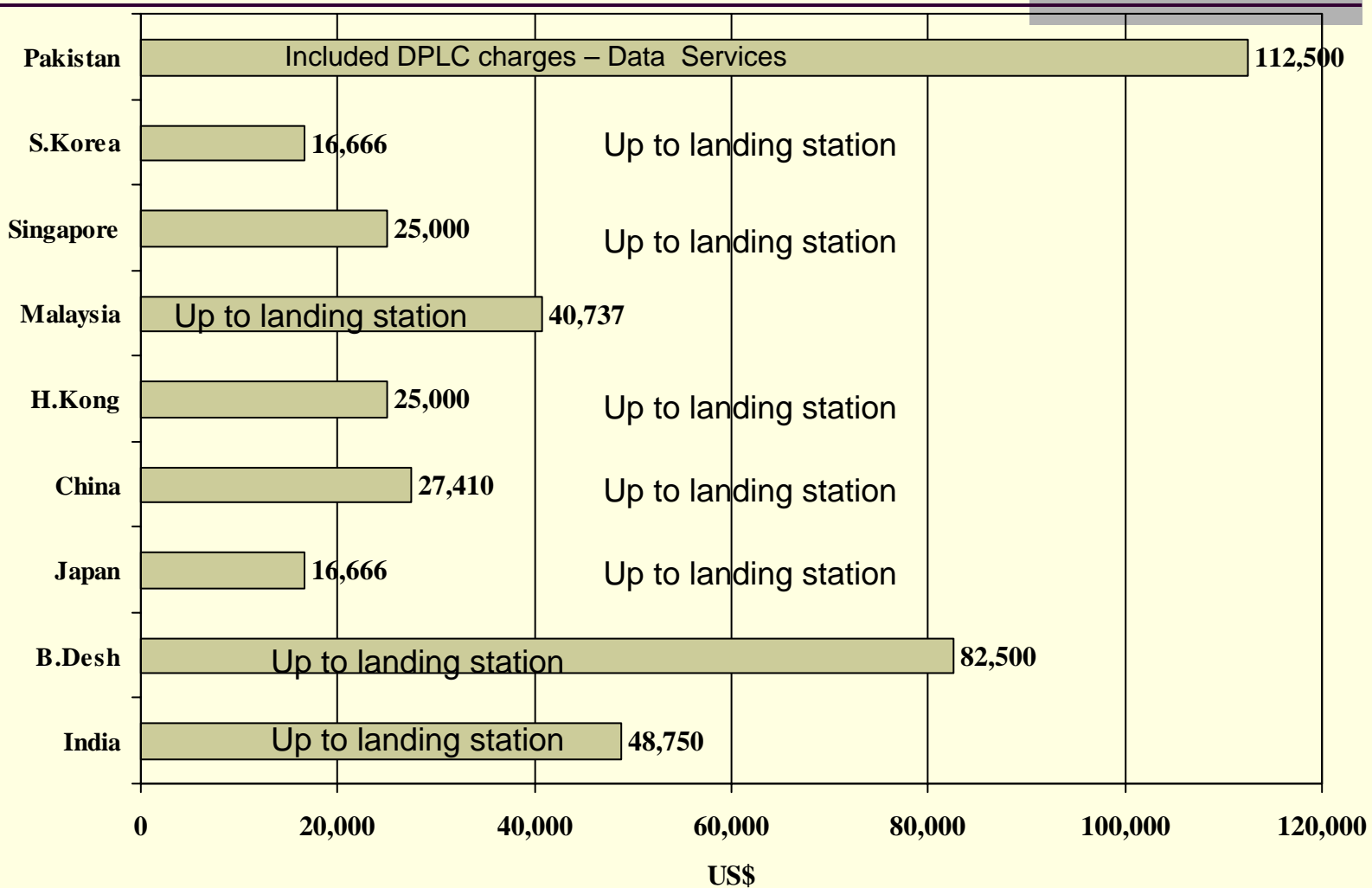
Source: TRAI / PTA Research

# IPLC Tariffs for DS-3 Capacity



Source: TRAI / PTA Research

# IPLC Tariffs for STM-1 Capacity



Source: TRAI / PTA Research

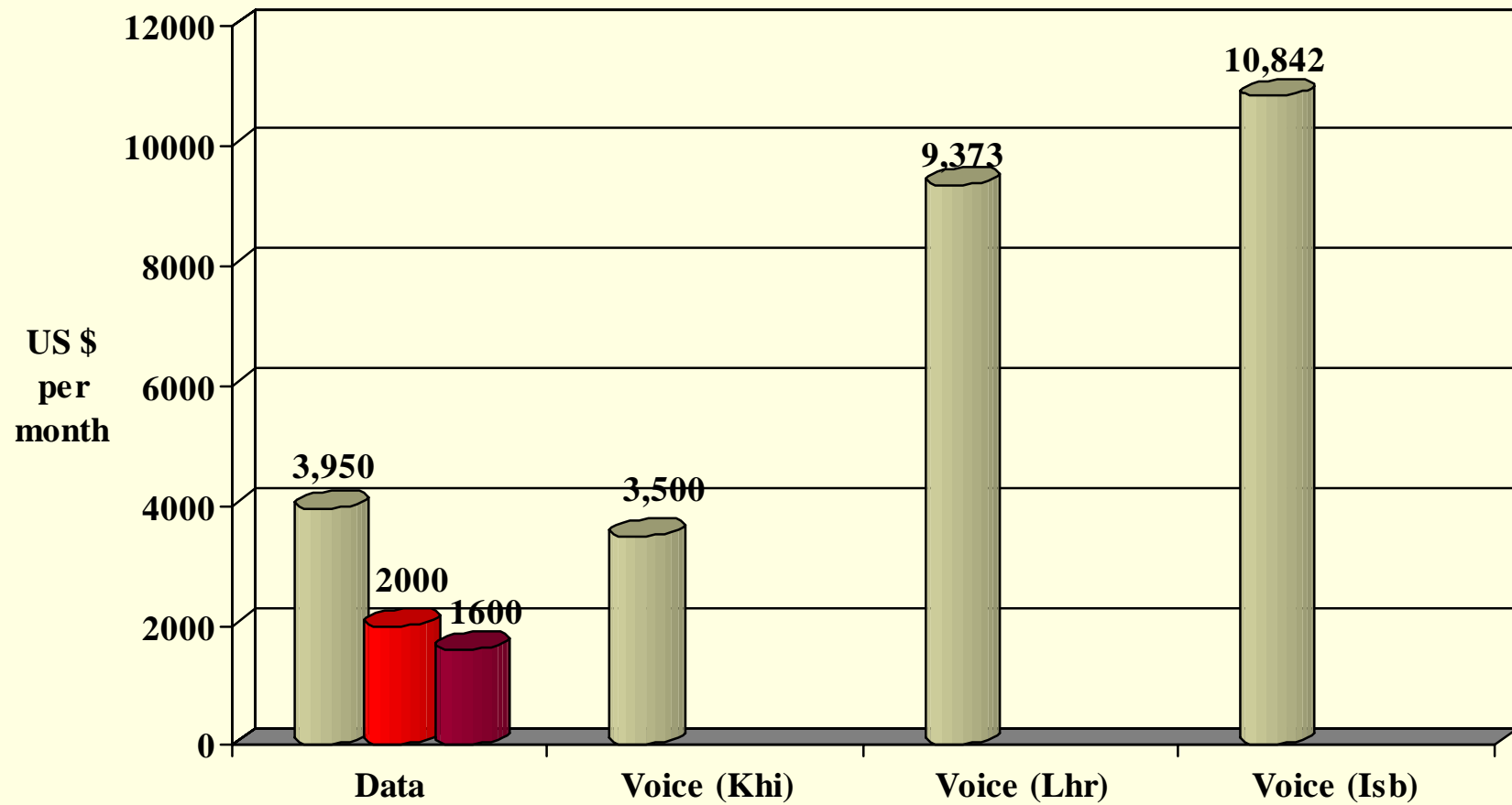
# PTCL's IP Bandwidth Tariffs

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- PTCL segments its IP bandwidth tariffs for voice and data services.
- During the consultation process, PTCL further reduced tariffs for data services, thus, further increasing disparity between data and voice services.
- However, price multiples were not rationalized.

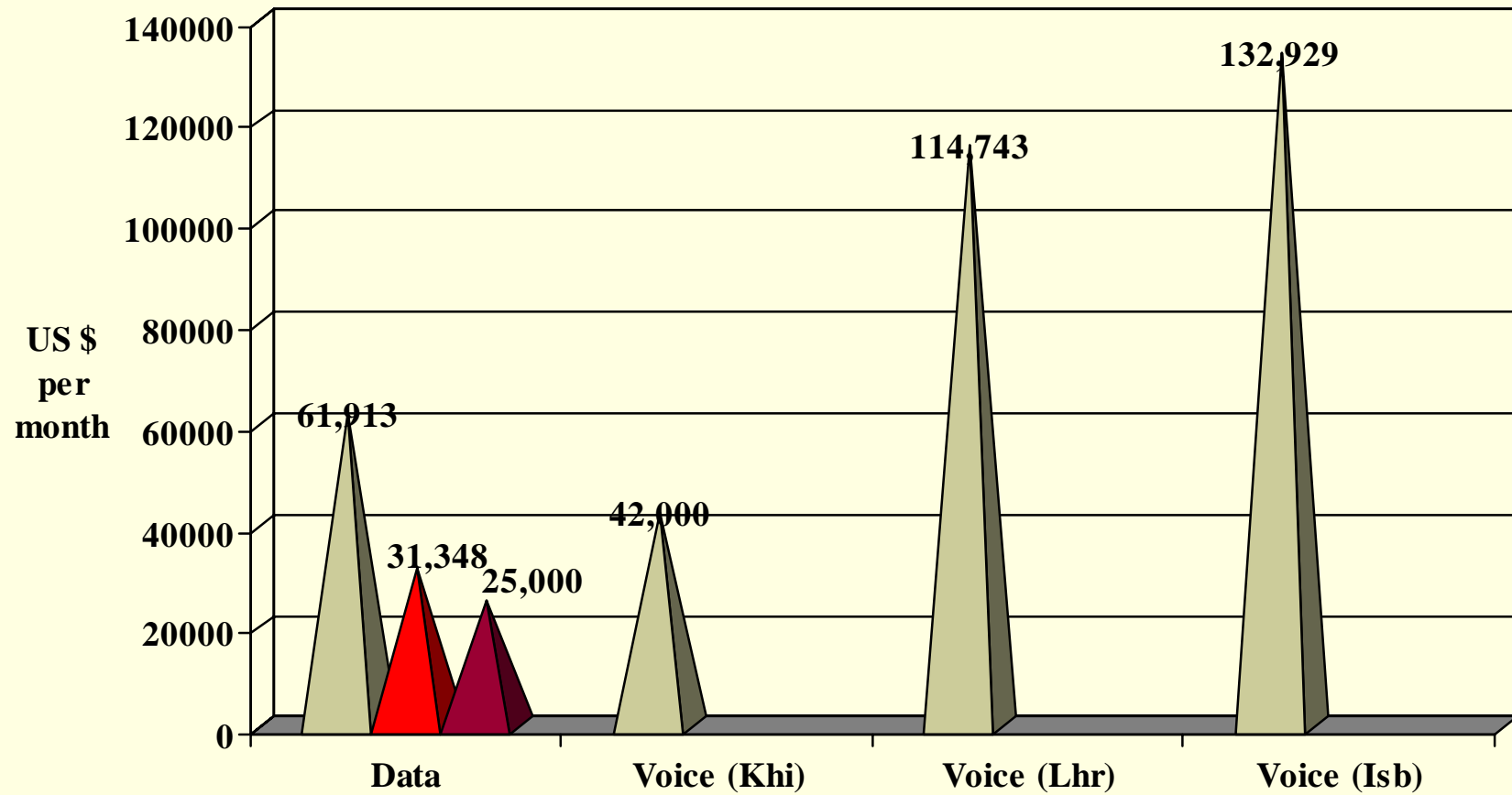
# Comparison of Data & Voice Tariffs

## E-1 Capacity



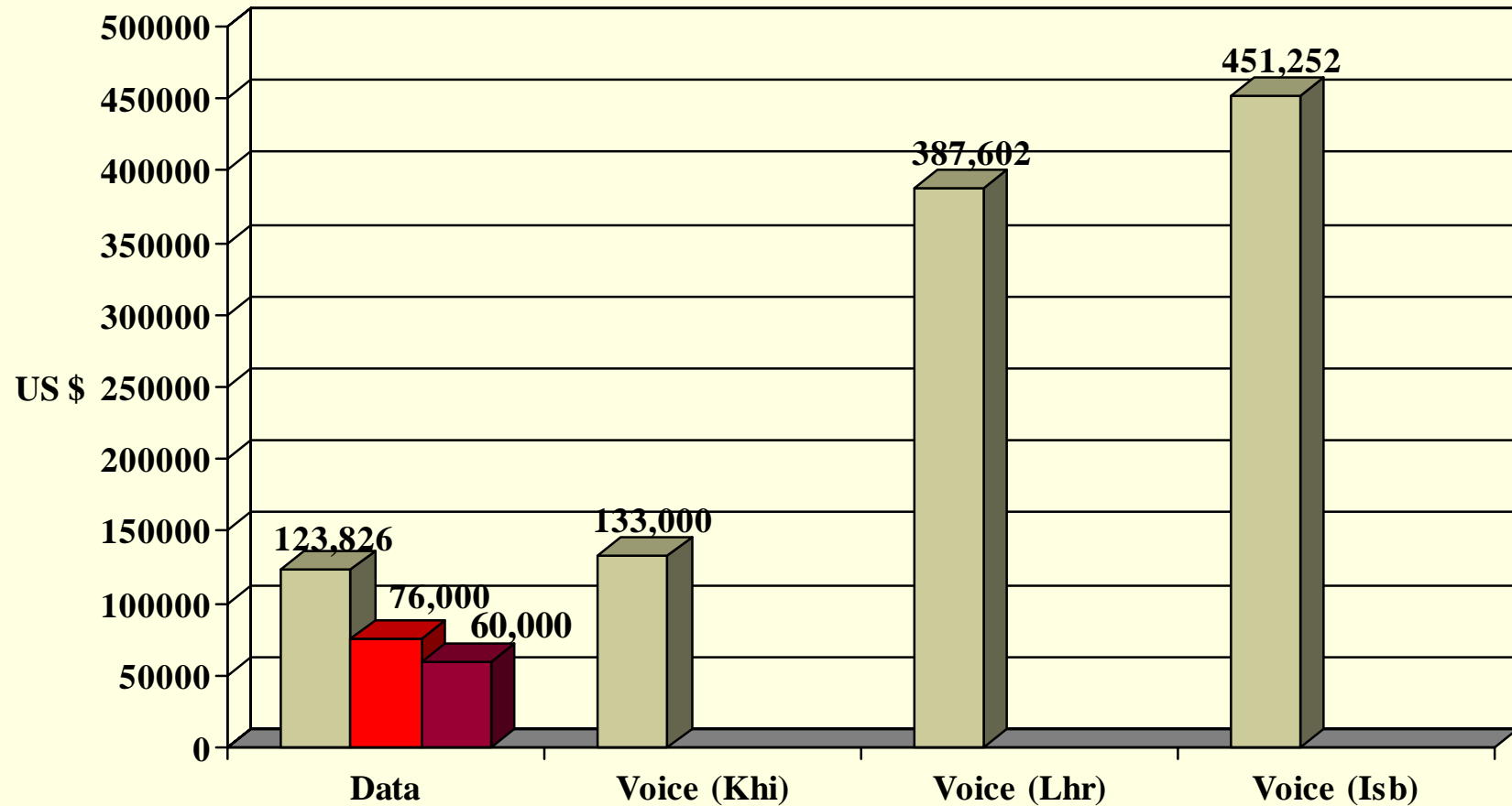
Source: PTCL

# Comparison of Data & Voice Tariffs DS-3 Capacity



Source: PTCL

# Comparison of Data & Voice Tariffs STM-1 Capacity



Source: PTCL

# Decline in Bandwidth Prices - Internationally

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- As per Gartner Report 2004, International Bandwidth prices were expected to continue to decline by 20 – 25% annually during the next three years i.e. from 2005 to 2007.
- Internationally, demand / growth in bandwidth has outpaced decline in bandwidth prices.
- Monthly Recurring charge for competitive routes that connect Singapore, Hong Kong and Japan are approximately US\$ 1000 for an E-1 IPLC.



# Decline in Bandwidth Prices - Internationally

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- As per Ovum's research report on "After the Implosion: the market for Int'l Bandwidth", the end of glut is misplaced perception due to the following reasons:
  - Supply and Demand are the critical factors
  - Geography still matters, market equilibrium depends on the region and the route and;
  - Bandwidth shortages are now becoming a possibility on some routes, in some locations

# Salient Features of Determination IPLC Tariffs

USD per month

Capacity	Previous Tariffs (Distance-less)		Effective 1/1/07 (up to landing station)	
	ISPs / DNOPs	LDI Ops	ISPs	Voice Services
E-1	3,000	2,852	2,100	2,300
DS-3	48,000	-	16,800	18,400
STM-1	112,500	-	48,300	52,900
Price Multiples	1:16:38		1:8:23	1:8:23

# Salient Features of Determination IP Tariffs for Data Services

USD per month

<b>Capacity</b>	<b>Previous Tariffs</b>	<b>Effective 1/1/07</b>
E-1	1,600	1,500
DS-3	25,000	24,000
STM-1	60,000	46,500
Price Multiples	1:16:38	1:16:31

# Salient Features of Determination IP Tariffs for Data Services

Location	Previous Tariffs			USD per month
	2 Mbps	8 Mbps	34 Mbps	155 Mbps
Karachi	2,800	10,080	33,600	106,400
Lahore	7,500	29,500	91,800	310,100
Islamabad	8,700	34,350	106,350	361,000

Location	Effective Tariffs			USD per month
	2 Mbps	8 Mbps	34 Mbps	155 Mbps
Karachi	2,400	8,400	24,000	74,400
Lahore	6,500	22,750	65,000	201,500
Islamabad	7,700	26,950	77,000	238,700

# PTA Determination on Bandwidth Tariffs

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- In order to safeguard / protect interest of new players, PTA did not drastically reduce tariffs of International bandwidth
- Ample margins are still available to new players as well as to PTCL.
- PTA has segregated DPLC from IPLC and determined IPLC tariffs up to landing point @ US \$ 2,100.
- PTA has narrowed the gap between voice and data services
- As there are only three active players, there is still room for the investors to take advantage of the situation

# The Aftermath....

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- PTA's determination on Int'l Bandwidth was challenged by PTCL in the court of Law.
- Although, the High Court has upheld PTA's determination, PTCL has again challenged it in the highest apex court i.e. Supreme Court of Pakistan
- Till to date, no stay order has been granted against the decision of High Court. Thus, PTA's tariffs stand effective
- With the increase in competition the bandwidth tariffs will become more competitive as the new entrants have started offering similar products at 20-30% discount

# Lessons Learned

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- Every Country / Market has its own dynamics / characteristics.
- Ideally, the prices of wholesale services should be based on costs in a monopoly scenario but in the long run competition delivers the wonders and the role of the regulator is to play a positive role in the transition period
- Benchmarking is a very tricky phenomenon and should not be solely relied upon for all types of tariffs determinations



Thanks