

Expert Forum on ICT Sector Indicators and Benchmark Regulation for
SAARC NRAs

Collecting & Reporting Indicators

Problems, Potential

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- ▶ Indicators to analyze performance
- ▶ Using indicator data for benchmarking – some problems
- ▶ What can you (the NRA) collect?
- ▶ Some new benchmarking tools that may help you do your job better/easier

There is a LOT of indicator data: e.g. ITU collects data on 100+ different indicators per country

	Series Name
1	% automatic main lines
2	% digital main lines
3	% female Internet users
4	% of homes with a Personal Computer
5	% of homes with Internet
6	% of households with a radio
7	% of households with a telephone
8	% of households with a television
9	% of main lines in urban areas
10	% of telephone faults cleared by next working day
11	% residential main lines
12	Average annual exchange rate per US\$
13	Business telephone connection charge
14	Business telephone connection charge (US\$)
15	Business telephone monthly subscription
16	Business telephone monthly subscription (US\$)
17	Consumer price index (1995=100)
18	Coverage of population (%)
19	Faults per 100 main lines per year
20	Fixed telephone service investment
21	Fixed telephone service investment (US\$)
22	Gross domestic product (GDP) - local currency
23	Gross domestic product (GDP) (US\$)
24	Gross Fixed Capital Formation (GFCF) - local currency
25	Gross Fixed Capital Formation (GFCF) (US\$)
26	Home satellite antennas
27	Households
28	International incoming telephone traffic (calls)
29	International incoming telephone traffic (minutes)
30	International Internet Bandwidth (Mbps)
31	International outgoing telephone traffic (calls)
32	International outgoing telephone traffic (minutes)
33	International telephone circuits
34	Internet subscribers (Cable modem)
35	Internet subscribers (Dial-up)

36	Internet subscribers (DSL)
37	Internet subscribers (Total broadband)
38	Internet subscribers (Total broadband) per 100 inhabitants
39	Internet subscribers (Total)
40	Internet subscribers (Total) per 100 inhabitants
41	Internet users (estimated number)
42	Internet users per 100 inhabitants
43	ISDN Channels
44	ISDN subscribers
45	Main telephone lines (fixed lines) in operation
46	Main telephone lines (fixed lines) per 100 inhabitants
47	Main telephone lines in largest city
48	Mobile cellular - price of 3-minute local call (off-peak - US\$)
49	Mobile cellular - price of 3-minute local call (off-peak)
50	Mobile cellular - price of 3-minute local call (peak - US\$)
51	Mobile cellular - price of 3-minute local call (peak)
52	Mobile cellular connection charge
53	Mobile cellular connection charge (US\$)
54	Mobile cellular monthly subscription
55	Mobile cellular monthly subscription (US\$)
56	Mobile cellular telephone subscribers - (Total)
57	Mobile cellular telephone subscribers - prepaid subscribers
58	Mobile cellular telephone subscribers (Digital)
59	Mobile cellular telephone subscribers per 100 inhabitants
60	Mobile communication investment
61	Mobile communication investment (US\$)
62	Mobile communications staff
63	Number of local telephone (calls)
64	Number of local telephone (minutes)
65	Number of national long distance telephone (calls)
66	Number of national long distance telephone (minutes)
67	Personal computers
68	Personal computers per 100 inhabitants
69	Population
70	Population - Urban population (%)

71	Population of largest city
72	Price of a 3-minute fixed telephone local call (off-peak rate)
73	Price of a 3-minute fixed telephone local call (off-peak rate)
74	Price of a 3-minute fixed telephone local call (peak rate - US\$)
75	Price of a 3-minute fixed telephone local call (peak rate)
76	Public pay phones
77	Public pay phones per 1000 inhabitants
78	Radio equipped households
79	Radio sets
80	Residential monthly telephone subscription
81	Residential monthly telephone subscription (US\$)
82	Residential telephone connection charge
83	Residential telephone connection charge (US\$)
84	Revenue from fixed telephone service
85	Revenue from fixed telephone service (US\$)
86	Revenue from mobile communication
87	Revenue from mobile communication (US\$)
88	Staff (female telecommunication staff)
89	Staff (Total full-time telecommunications staff)
90	Telecommunication equipment (Export) (US\$)
91	Telecommunication equipment (Import) (US\$)
92	Television equipped households
93	Television receivers
94	Television receivers per 100 inhabitants
95	Television subscribers (cable)
96	Total annual investment in telecom
97	Total annual investment in telecom (US\$)
98	Total capacity of local public switching exchanges
99	Total national telephone traffic (calls)
100	Total national telephone traffic (minutes)
101	Total revenue from all telecommunication services
102	Total revenue from all telecommunication services (US\$)
103	Total telephone subscribers (fixed + mobile)
104	Total telephone subscribers (fixed + mobile) per 100 inhabitants
105	Waiting list for main lines

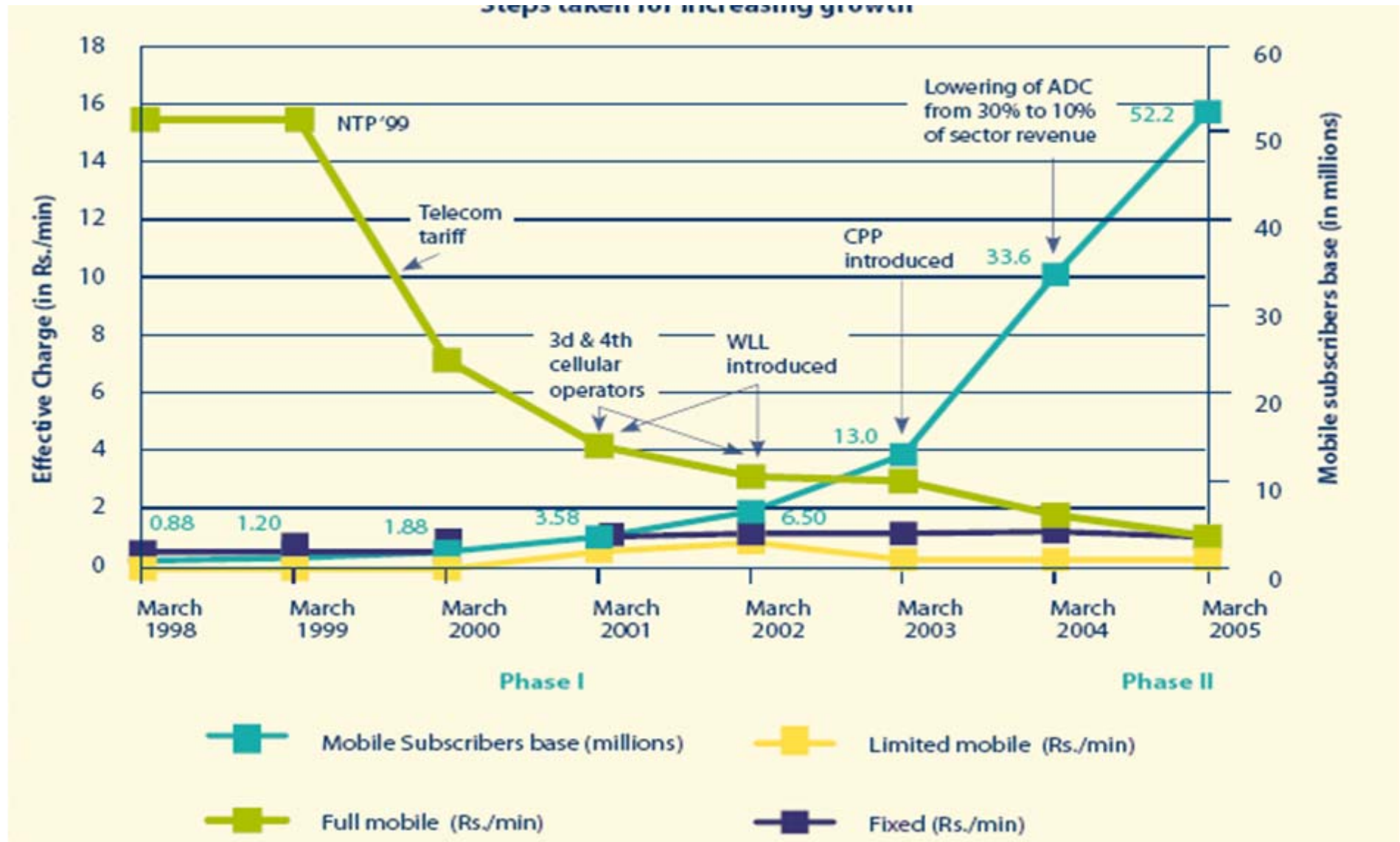
This data is used for developing other indices that receive a lot of publicity

- ▶ Multiple composite e-indices
 - Digital Opportunity Index
 - ICT Opportunity Index
 - E-Readiness
 - etc.
- ▶ Many calculated/tracked by Multilateral Agencies,
- ▶ Used to rank countries
 - Countries categorized into “advanced”, “emerging”, “backwards” etc based on them
- ▶ Receive a lot of publicity

E.g. World Information Society Report cites many such indices...

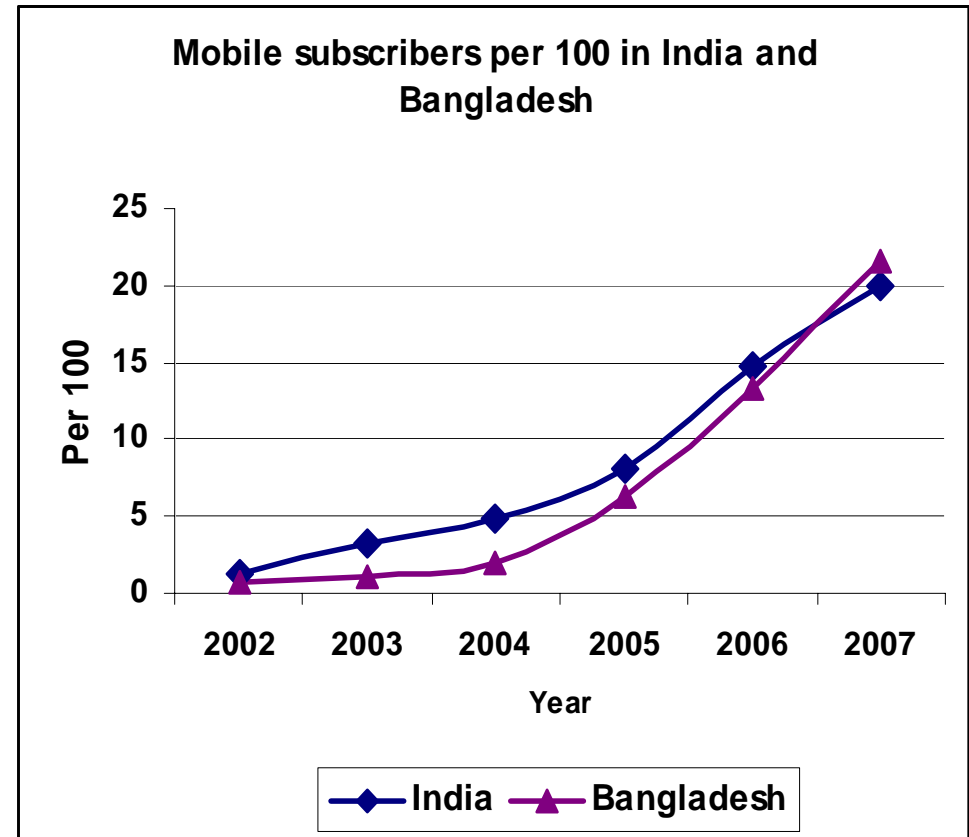
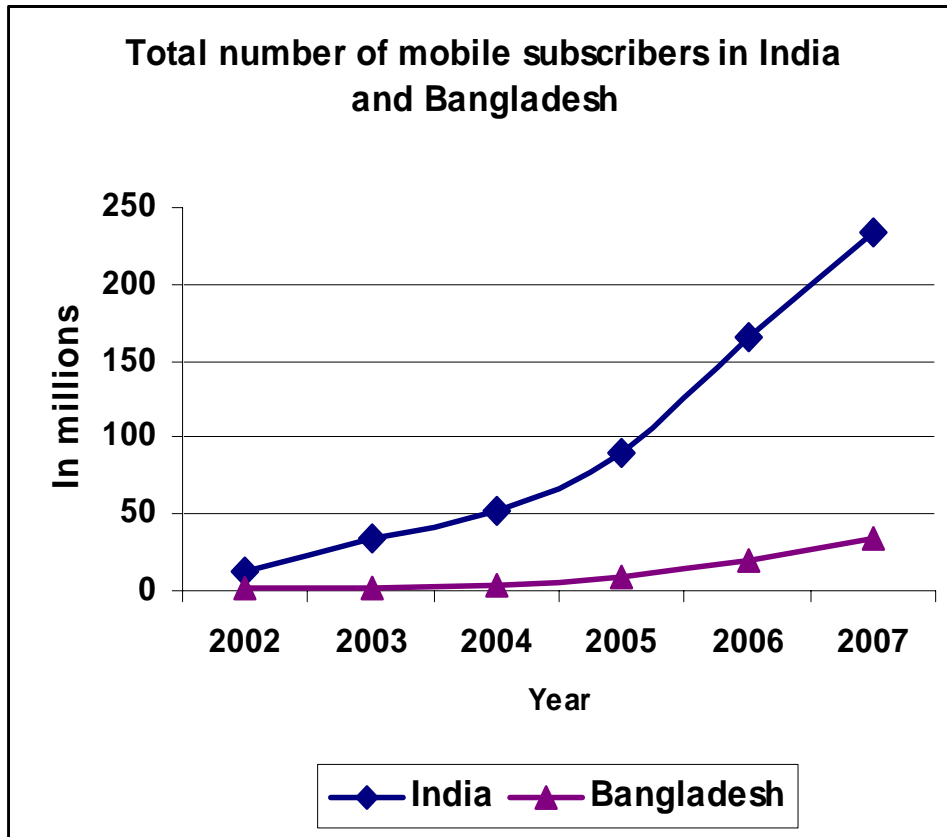
<i>Name of index (organisation)</i>	<i>Number of economies</i>	<i>Number of indicators</i>	<i>Latest data</i>	<i>Comments</i>
Digital Opportunity Index (ITU/UNCTAD/KADO) ²⁰	180	11	2004/05	Three clusters: <i>Utilization, Infrastructure and Opportunity</i> (see Chapter two).
ICT Opportunity Index (ORBICOM/ITU) ²¹	139	17	2003	Compares ' <i>Infostates</i> ', ' <i>Infodensity</i> ' and ' <i>InfoUse</i> ' against an imaginary economy called ' <i>Hypothetica</i> '.
ICT Development Index (UNCSTD) ²²	180	8	2003	Four clusters: <i>Access, Connectivity, Usage and Policy</i> .
Informational Society Index (IDC) ²³	52	15	2004	Only sparse methodological data is disclosed.
E-Readiness Index (EIU/IBM) ²⁴	68	31	2004/05	Six clusters: <i>Connectivity, Business environment, Adoption, Legal and policy environment, social and cultural environment, Supporting e-services</i> . Uses a mix of quantitative and survey data.
Network Readiness Index (InfoDev/WEF/INSEAD) ²⁵	102	48	2003	Three clusters: <i>Environment, Readiness, Usage</i> . Uses a mix of survey, qualitative and quantitative data.
Digital Access Index (ITU) ²⁶	179	8	2002	Five clusters: <i>Infrastructure, Affordability, Knowledge, Quality, Usage</i> .
Mobile/Internet Index (ITU) ²⁷	171	26	2001	Three clusters: <i>Infrastructure, usage, market conditions</i> .
Technology Achievement Index (UNDP) ²⁸	71 (full data)	8	1998-2000	Four clusters: <i>Creation of technology, Diffusion of recent innovations, Diffusion of old innovations, Human skills</i> .

This data is used effectively to analyze impact of different actions. E.g. the diagram showing impact of regulatory actions on Indian mobile prices & growth quoted repeatedly



Indicators come into their own in benchmarking – you may think you are doing well until you are compared to others.

E.g. Who wins the connectivity game? India or Bangladesh?



Benchmarking is best use of indicator data. But it brings out a number of problems..

- ▶ Lack of standard or meaningful definitions
- ▶ Different (data) collecting periods
- ▶ Multiple sources reporting the same data

...problems with lack of clear/standardized definitions leave room for interpretation

▶ What does Number of Mobile Subscribers mean?

- Most operators reporting SIM cards. Not # of human subscribers/users
- Many users own more than one SIM cards
- Some operators simply reporting all SIMs issued (irrespective of active/not-active)
- Stop referring to subscribers and talk about “# of mobile SIMs”.
- Should have a cut-off (i.e. SIM cards that have used a fee-paying service in the past 3 months)?

▶ What does Number of Fixed Lines/Phones mean?

- Is Fixed Wireless (e.g. CDMA) included?
- ITU includes CDMA on the fixed side
- India included CDMA under fixed till about 3 years ago, but now counts it under mobile (so historical graphs have a sudden “bump”)

...problems with non standard reporting periods (financial years)

- ▶ Many countries on a Jan – Dec financial year and the same reporting period.
 - Sri Lanka
- ▶ India on April – March financial year, and reporting period
- ▶ Pakistan July – June financial year...etc.
- ▶ Comparing annual data need the same “year”
- ▶ One way to avoid the problem is to have countries report quarterly
 - Pick the right quarters when comparing

...problems due to multiple data sources: Who is data “authority”?

Year	# of internet subscribers (millions), India			Difference between...	
	NASSCOM data	TRAI Data	Ministry of Statistics & PI	NASSCOM & TRAI numbers	TRAI & Ministry numbers
1999	0.35		0.23	-	-
2000	0.65	0.95	0.943	-46%	1%
2001	1.13	3.04	2.909	-169%	4%
2002	1.763	3.42	3.239	-94%	5%
2003	3.661	3.64	3.5	1%	4%
2004	4.403	4.55	4.05	-3%	11%
2005	6.674	5.55	5.3	17%	5%
2006		6.94	5.556	-	20%

Note: Based on Financial Year – e.g. “2000” refers to April 1999 – Mar 2000

Source: NASSCOM Strategic Review 2005; TRAI; Ministry of Statistics and Program Implementation, Govt. of India

Well defined indicators, used in the right way can help the regulator and operators. Increasingly, they can help the consumer

- ▶ For the regulator to track goals are being achieved
 - Increased connectivity
 - Increased quality of service
 - Decreasing prices
 - Increased choice

- ▶ For the operators, to see if they are competitive in terms of
 - price , range of products, profitability, growth

- ▶ But as data becomes more accessible, it becomes a useful tool for the consumer
 - To maximize value for money.
 - E.g. pay only for real quality vs. believe what's in advertising

The regulator plays a key role in indicator collection, aggregation, reporting

- ▶ You have the authority
 - As a condition of licensing
- ▶ You have a genuine need
 - To see if your actions are having the required impact
 - To see if the sector is performing well
- ▶ What types of indicator data can/should you collect?

1. Connectivity Indicators

- ▶ Most important set of sector indicators
- ▶ Most frequently used indicator (and most important in early stages)

A basic list should include....

FIXED

- ▶ Number of fixed phones (= number of fixed wireline phones + number of fixed wireless phones)
- ▶ Total fixed line subscribers per 100 inhabitants

MOBILE

- ▶ Number of mobile SIM cards = total prepaid SIMs + total postpaid SIMS
- ▶ Total mobile subscribers per 100 inhabitants

TOTAL (Fixed & mobile)

- ▶ Number of telephone connections (access paths) per 100 inhabitants

DIGITAL DIVIDE

- ▶ Number of urban vs. rural telephone connections per 100 inhabitants

ICT

- ▶ Total number of Internet connections
- ▶ Number of broadband Internet connections

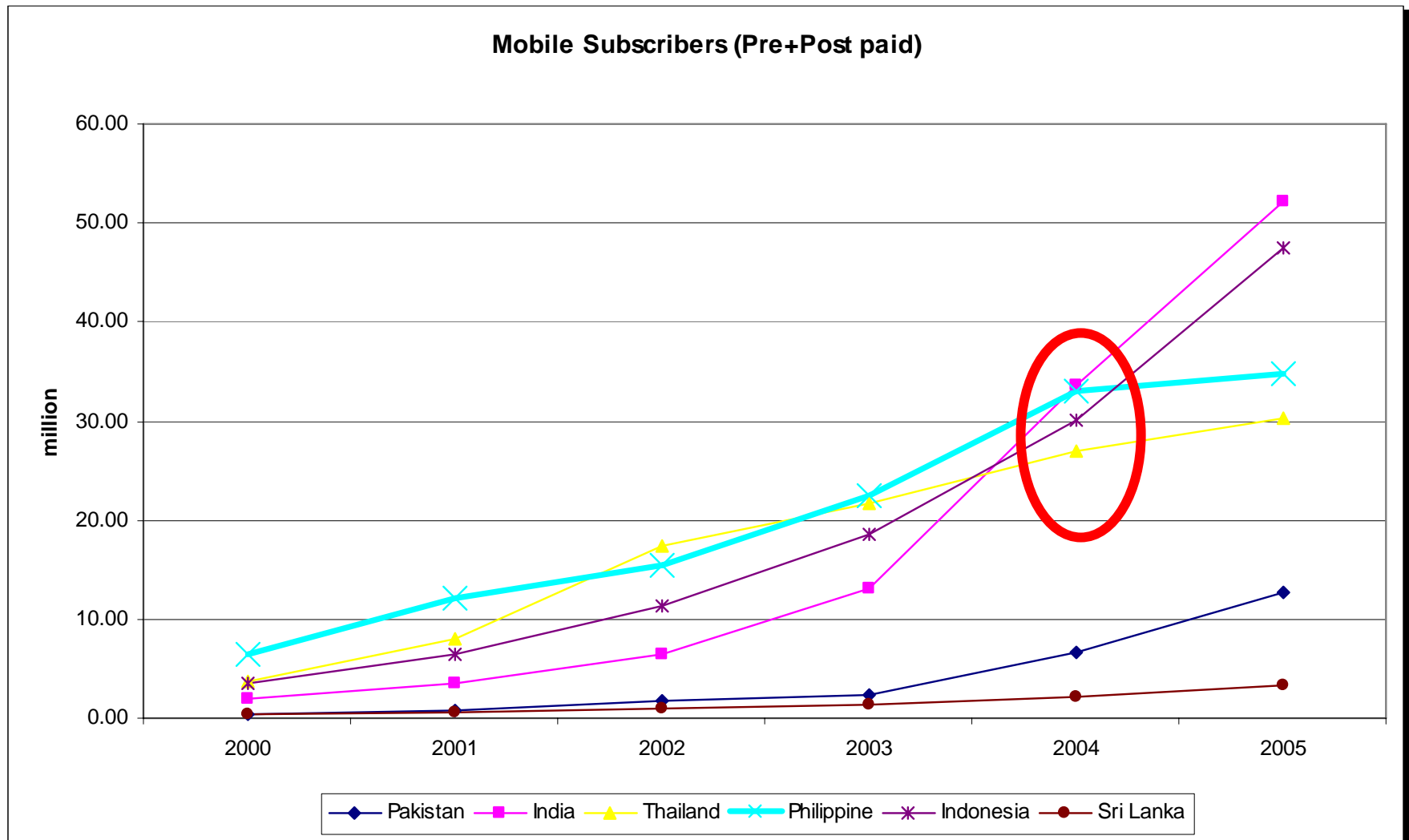
GOEGRAPHIC GROWTH/CHOICE (?)

- ▶ Backbone map for a country
- ▶ Mobile coverage map per operator
- ▶ Base station map per operator

But we need to agree on basic definitions.. E.g. who is a subscriber? Who is an active?

- ▶ Admit we are reporting SIM cards
 - Operators/NRA doesn't know Subscriber/user vs. SIMs
 - Survey can reveal Subscribers (or average # of SIMs per user)
- ▶ Is CDMA (Fixed Wireless) to be counted under
 - Fixed phones (Sri Lanka, others)
 - Mobile phones (India)
- ▶ Report and count Installed capacity or actual (used) lines?
 - Philippines reports both: result of USO policy where new entrants were required to install lines with 10:1 urban to rural ratio
 - Thailand: measures/reports installed, has large number of unused lines under condominiums while having long waiting lists in rural areas
- ▶ How is an “active” mobile user (SIM) defined?
 - Indonesia: Indonesia used a 1 year cut-off period
 - Sri Lanka: Mobitel uses 3 months. Dialog varies by value of top-up-card.
 - Philippines: previously 4 months. In June 2004 changed to 1 month.

Change in definition of an active SIM in the Philippines “slowed” growth



2. Industry Structure and Industry Impact Indicators

- ▶ Structure:
 - monitoring for significant market power
- ▶ Impact:
 - telecom big contributor to GDP; big revenue generator for Govt.
 - makes the sector more visible
 - less likely to be faced with negative policies (e.g. taxes that may slow growth).
 - Important to Operators as well as regulators

A basic list should include...

▶ Industry Structure

- Measure of Market power/competition - HHI (Herfindhal-Hershman Index)
- A measure of market shares –based on subscribers, based on minutes, based on revenue

▶ Industry Impact

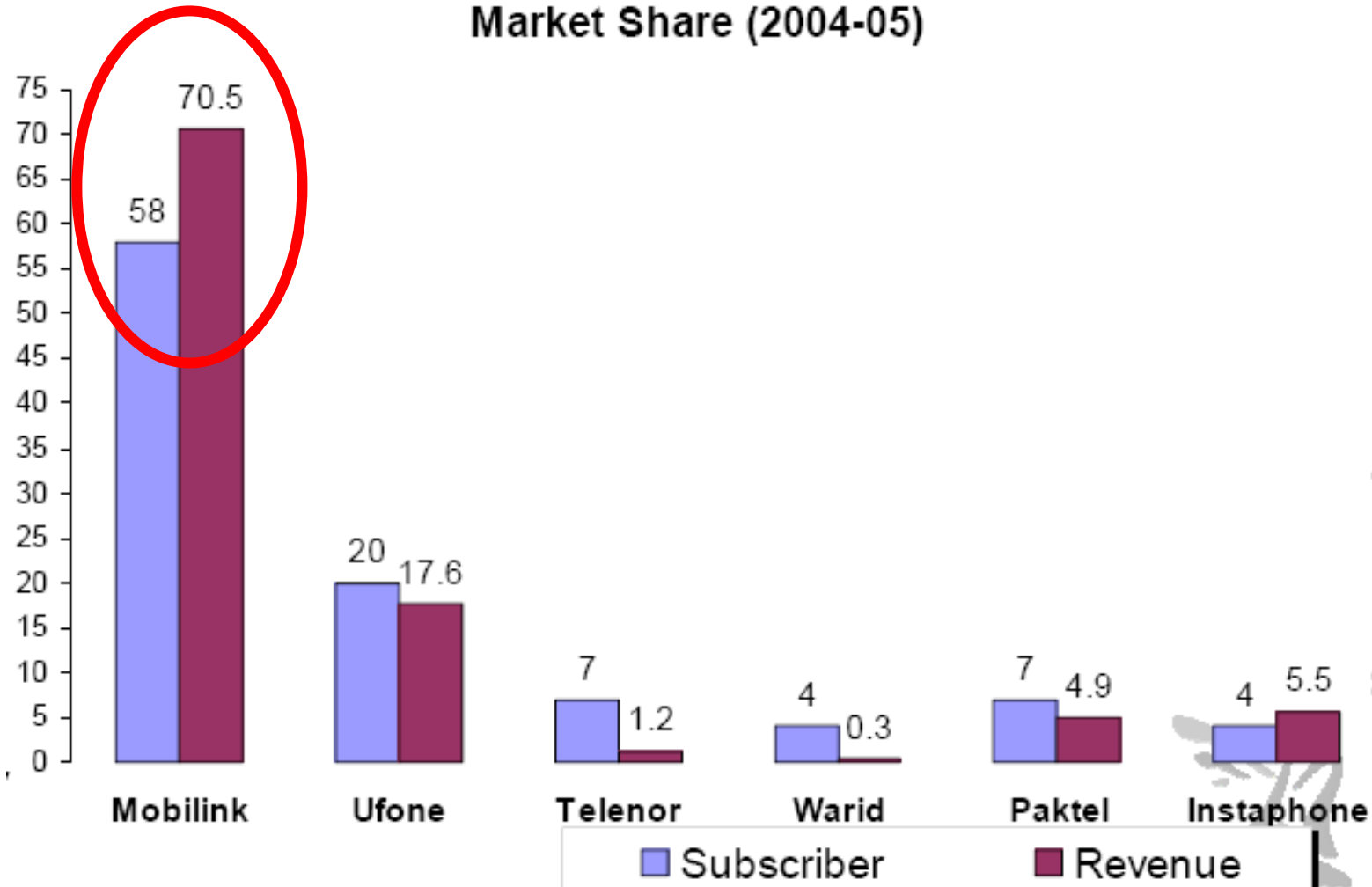
- Total annual investment in the telecom sector
- Foreign Direct Investment into the sector
- Total tax paid by the sector
- [Total employment in the telecom sector]

Industry structure is a key concern for you AND operators. E.g. Operators care about market share

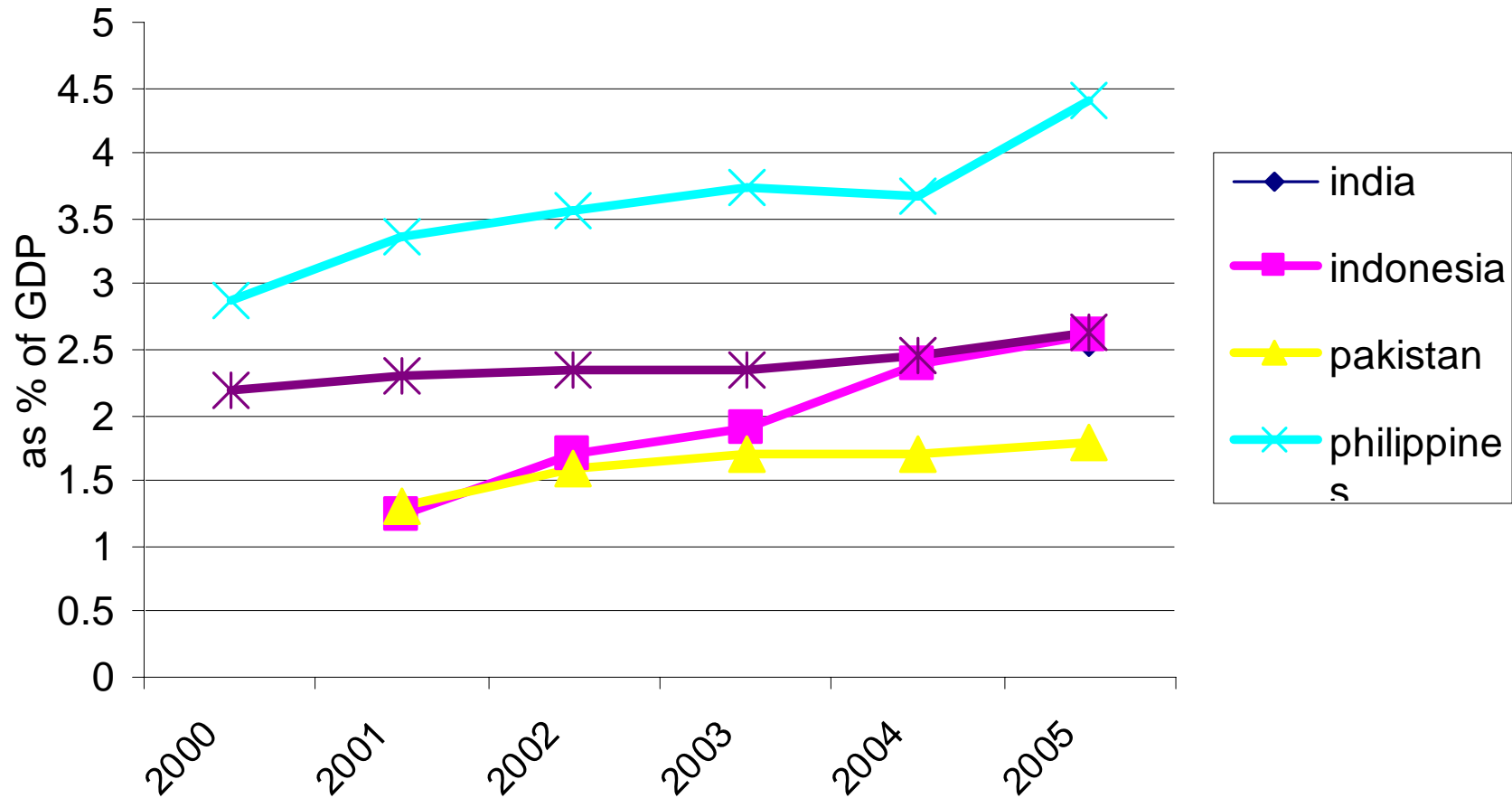
- ▶ Normally, market share of operator X = subscribers of operator X / Total subscribers
- ▶ Why? Why not based on Revenue or Minutes (traffic)?
- ▶ Example in Sri Lanka – financial analysts stating operator “losing market share” to competition.
 - Possible negative recommendation on stock
- ▶ But according to CEO,
 - “if SIM is given free or with pre-loaded value, customer uses the value, discards SIM, gets a new one”.
 - His company never does this (always charges for the SIM). But competitors DO.
 - The “competitors count all SIMs when reporting subscriber base” (including discarded ones) so there’s significant over counting
 - CEO “waiting” for regulator to “publish market share/growth by MINUTES, to prove that it is the largest and growing
- ▶ Method of calculating Market Share even more important when SMP regulation is involved
 - Asymmetric Regulation

Different calculations, different market shares...e.g. from Pakistan

Market Share (2004-05)



Industry Impact helps you argue for pro-telecom policies

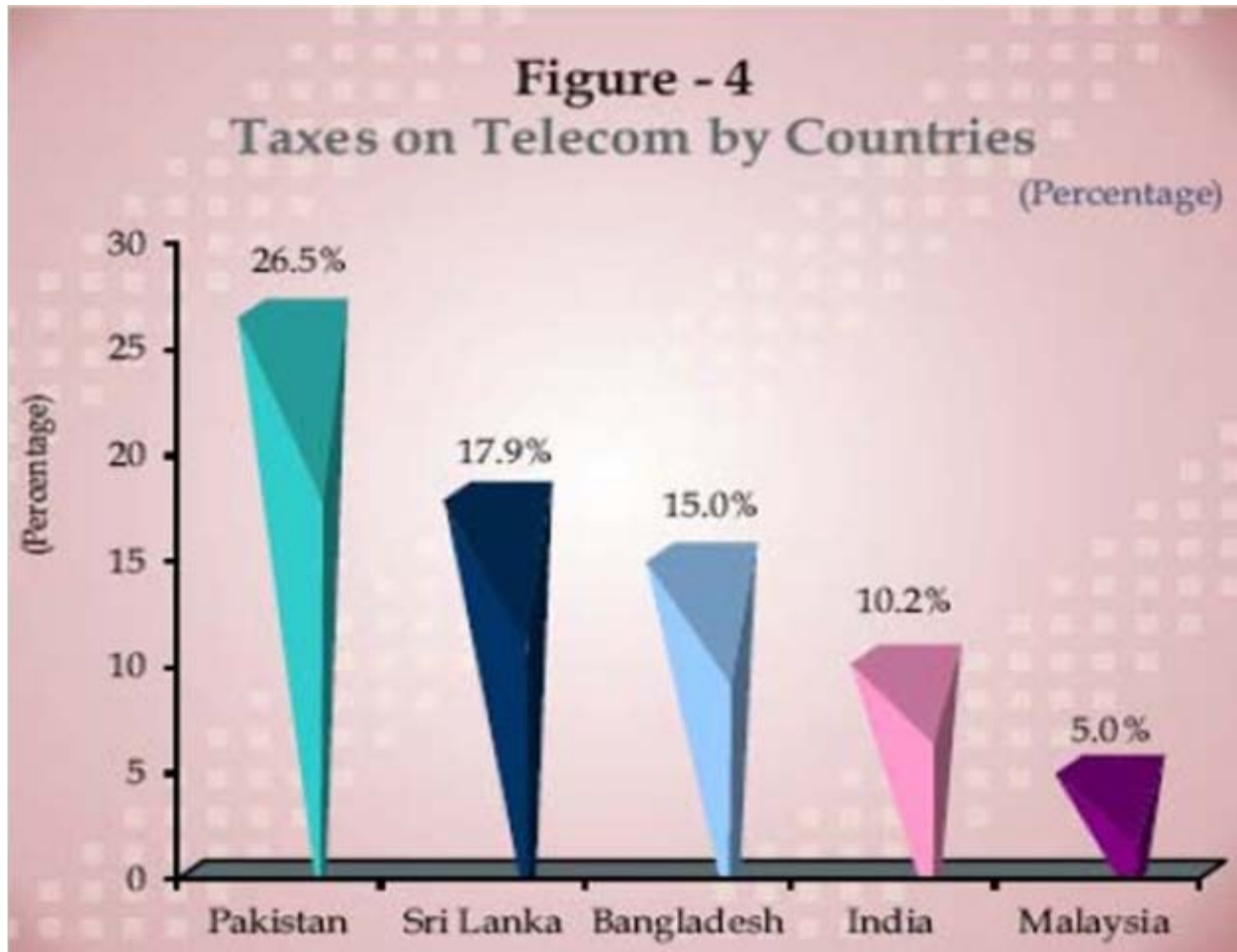


Taxes vary significantly country to country. What should you include?

	Pakistan	Sri Lanka	China	India
<u>Regulatory charges</u>	<u>%age of revenue</u>	<u>%age</u>	<u>%age of revenue</u>	<u>%age of revenue</u>
Service Tax, GST	GST	VAT	3%	8%+ GST
License Fee	0.5% + 0.5% R&D	0.3% turnover (t.o.) + 1% of capital invested (inv)	Nil	5~10%
Spectrum Charge	Cost recovery	~ 1.1% of t.o.	~ 0.5% ^{**} (China Mobile)	2~6% [*]
USO	1.5%	Nil (only on ISD calls)	Nil	Incl in license fees
<u>Total Regulatory charges</u>	2.5% +GST+ cost recovery	=1.3% t.o.+1% inv+ VAT	~ 0.5 % + 3% (Tax)	15% ~ 24% + GST

Source: TRAI, 2005

But can be a very useful tool for operators (to ask for lower taxes) and for policy makers (to ask for higher taxes?)



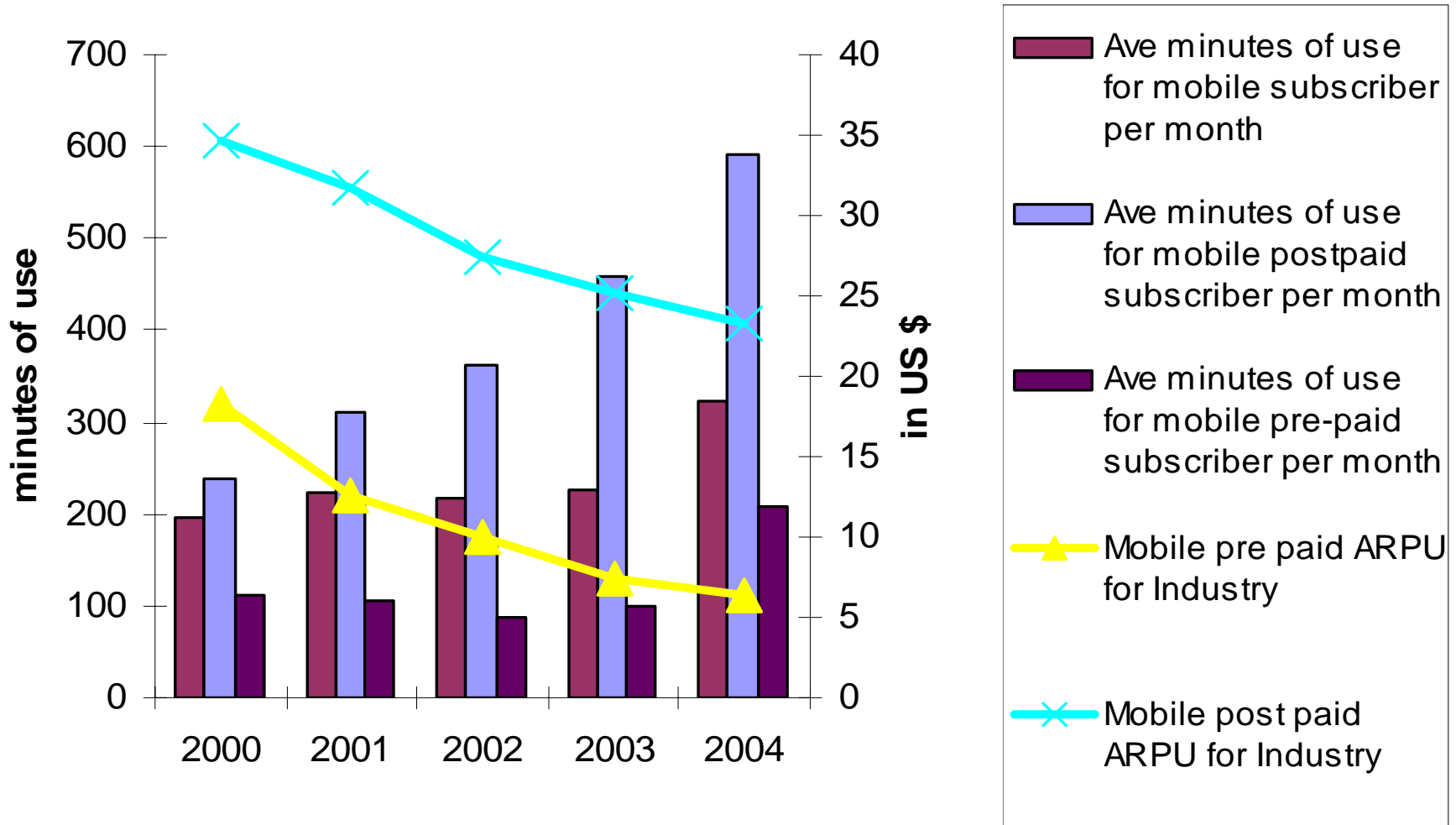
Revenue & Profitability Indicators

- ▶ Measures the financial health of the sector
- ▶ Gives an indication of how consumption is changing (e.g. comparing data vs. voice ARPU over time)
- ▶ **To be used with caution** – operators express concerned that monitoring EBTIDA (or other profitability) margins may lead to “regulation” of profits

A basic list could include:

- ▶ Average Revenue per User (ARPU) [subscriber]
- ▶ Fixed (wireline and wireless) ARPU per operator
- ▶ Fixed (wireline and wireless) ARPU for industry
- ▶ Mobile prepaid ARPU per operator
- ▶ Mobile postpaid ARPU per operator
- ▶ Mobile prepaid ARPU for industry (weighted by revenue)
- ▶ Mobile postpaid ARPU for industry (weighted by revenue)
- ▶ Mobile data revenue
- ▶ Roaming revenue earned per SIM
- ▶ Industry revenue
- ▶ **EBITDA margin per operator**

E.g. ARPU[s] with utilization → indicator of consumers being better off



Source: TRAI

Why EBITDA and E (Earnings = profits) BOTH matter for cross-country comparisons?

- ▶ EBITDA = Earnings before Interest, Tax, Depreciation and Amortization
- ▶ It's the final line in the income statement that can effectively compare across countries because
 - Taxes vary by country and distortionary
 - Interest varies by company/country
 - Accounting standards vary, therefore rules for Depreciation will vary by country
- ▶ For comparison, EBITDA makes sense.
- ▶ But Earnings also matter
 - Positive EBITDA with negative Earnings?
 - Should raise concerns about capital expenses/interests, taxes etc.

| Quality of Service

A basic list could include

▶ Telephony Quality

- Waiting list for main fixed lines
- Faults per 100 main (fixed lines) per year
- Percentage of telephone faults cleared by the next working day
- Call drop rates
- Percentage of connections with good voice clarity
- Call success rate

Many of these indicators are reported regularly already (through ITU etc)

▶ Broadband Quality

- Broadband download speed (kbps/Mbps)
- Broadband upload speed (kbps/Mbps)
- RTT (millisecond)- Round Trip Delay
- Jitter (millisecond)
- Packet- Loss (as a percentage)
- Broadband availability (as a percentage %)

Price and Affordability Indicators

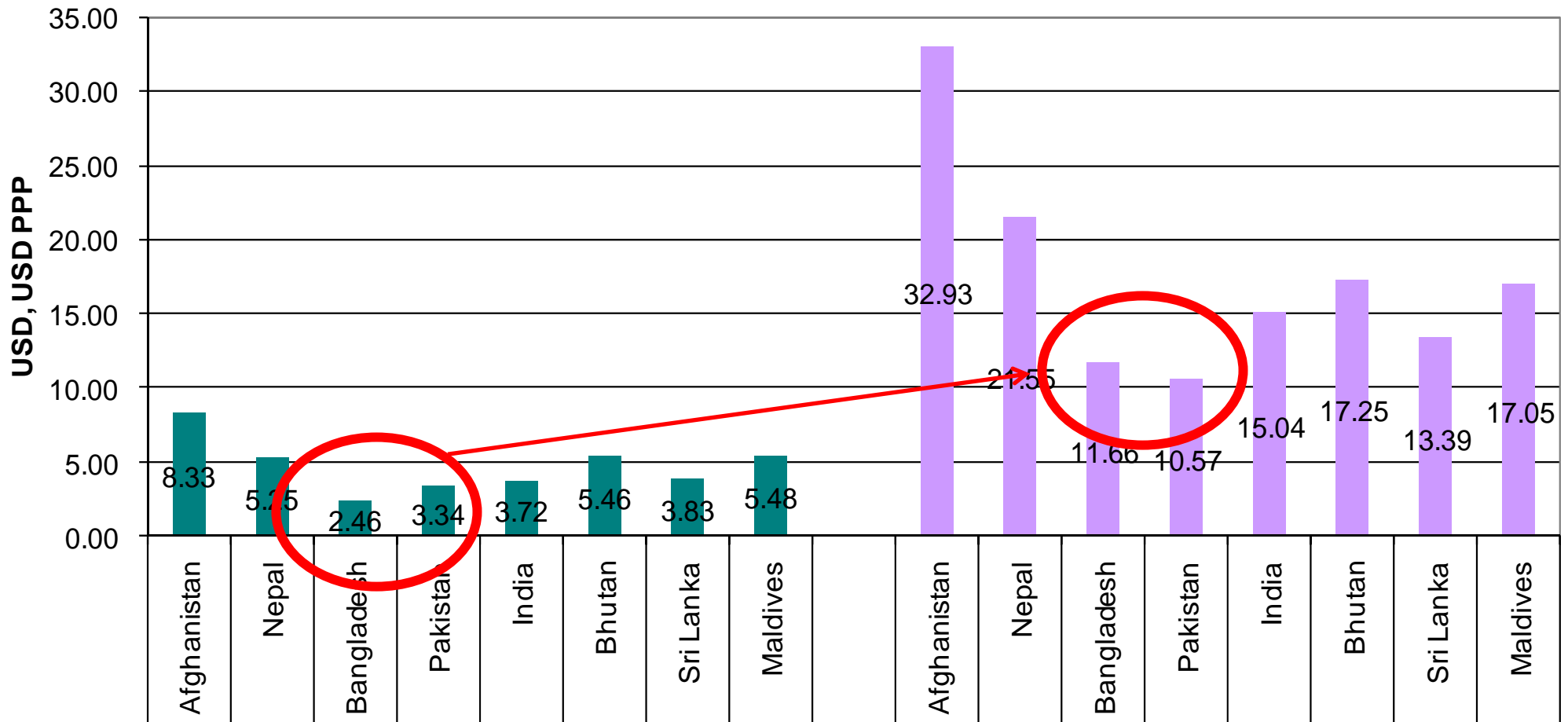
- ▶ Affordability: primary barrier to tele-use and ownership
- ▶ But comparison needs care...

A basic list should include

- ▶ Fixed/mobile prices
 - Pre-paid
 - Post paid
- ▶ Broadband prices
 - For different packages
- ▶ Domestic/International Leased line prices

USD or USD-PPP adjusted? Makes a difference in making price comparison

Monthly prepaid mobile cost for a low user (USD and USD PPP)

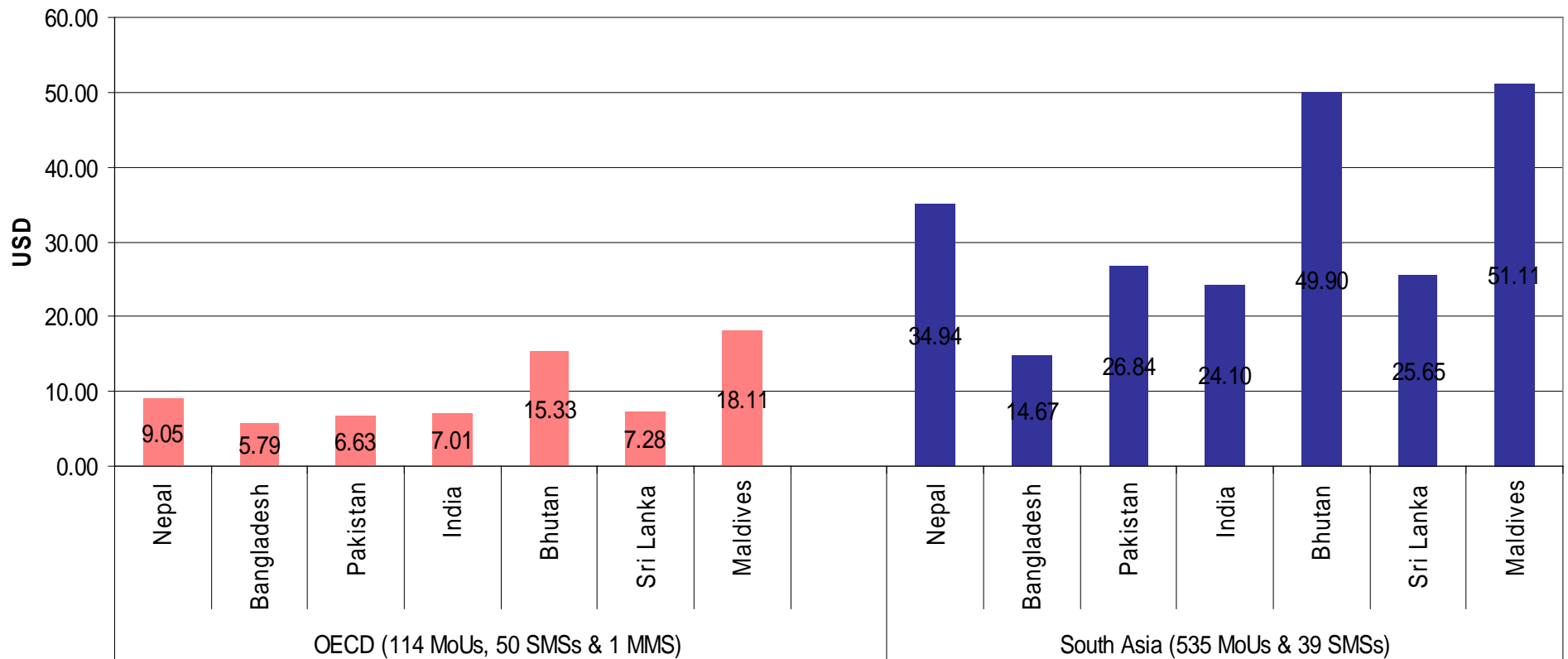


Difficult to compare mobile/fixed prices in a meaningful way

- ▶ ITU has tracked/reported
 - Price of 3 minute on-net/off-net call; price of SMS etc.
- ▶ But consumers use and think of price differently
 - Monthly expenditure, weekly expenditure etc.
 - For multiple services: SMS, voice, MMS
- ▶ Better: OECD defined “baskets” which calculates monthly cost for..
 - Multiple services: SMS, voice, MMS
 - Rental , connection fees etc
- ▶ But a typical OECD consumer is NOT a typical ASIAN consumer
 - E.g. we TALK more!
 - South Asian medium postpaid user = 535 MOU
 - OECD medium postpaid user = 114 MOU

Using a South Asian user profile vs. OECD user profile makes a big difference in how you understand prices

Monthly postpaid mobile cost for a medium user
(OECD and South Asian baskets)



...and so on to many other groups of indicators

- ▶ We can talk about problems and definitions all day
 - March 2007, SAARC + ASEAN + ITU.....we did talk about it for 2 days

But today we focus on Indicators as a tool for you

- ▶ To make your life easier
- ▶ To help you achieve the goals of regulation
- ▶ To provide you with the right incentives

To make your life easier....Banded Forbearance

- ▶ Last night's talk:
 - Can you NOT regulate price using price benchmarks and bands?
- ▶ Use precious time to regulate other important things
- ▶ Banded Forbearance
 - Defined upper/lower limit (band) for prices
 - No regulation as long as prices within band
 - Inquiries/regulation if prices above or below band
- ▶ Challenge: setting the right band
 - Based on which peer group? SAARC?
 - What's the upper limit? What's the lower limit?

To help you achieve the goals of good regulation...increased access, lowered cost, increased QoS, increased choice

- ▶ Focus on QoS
 - A new paradigm for Broadband QoS
- ▶ But less intrusive than traditional
 - Doesn't require you to go inside the operator's system
- ▶ Less dependent on operator than traditional
 - User driven
- ▶ Real time
 - Traditional method provides out-dated measures
 - After the quality has already deteriorated

To develop the right incentives for all stakeholders to collect, report and use **GOOD, VALID, COMPARABLE** indicator data

- ▶ An Asian initiative
 - Because regional variations exist
- ▶ Focus on incentives to Report and collect data
 - ITU model has no incentives
 - As a result has outdated data
- ▶ We propose an alternative