

# Competition in Telecom Market for Voice Telephony

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**Seminar on Economic and Market Analysis for  
CEEC and Baltic States**

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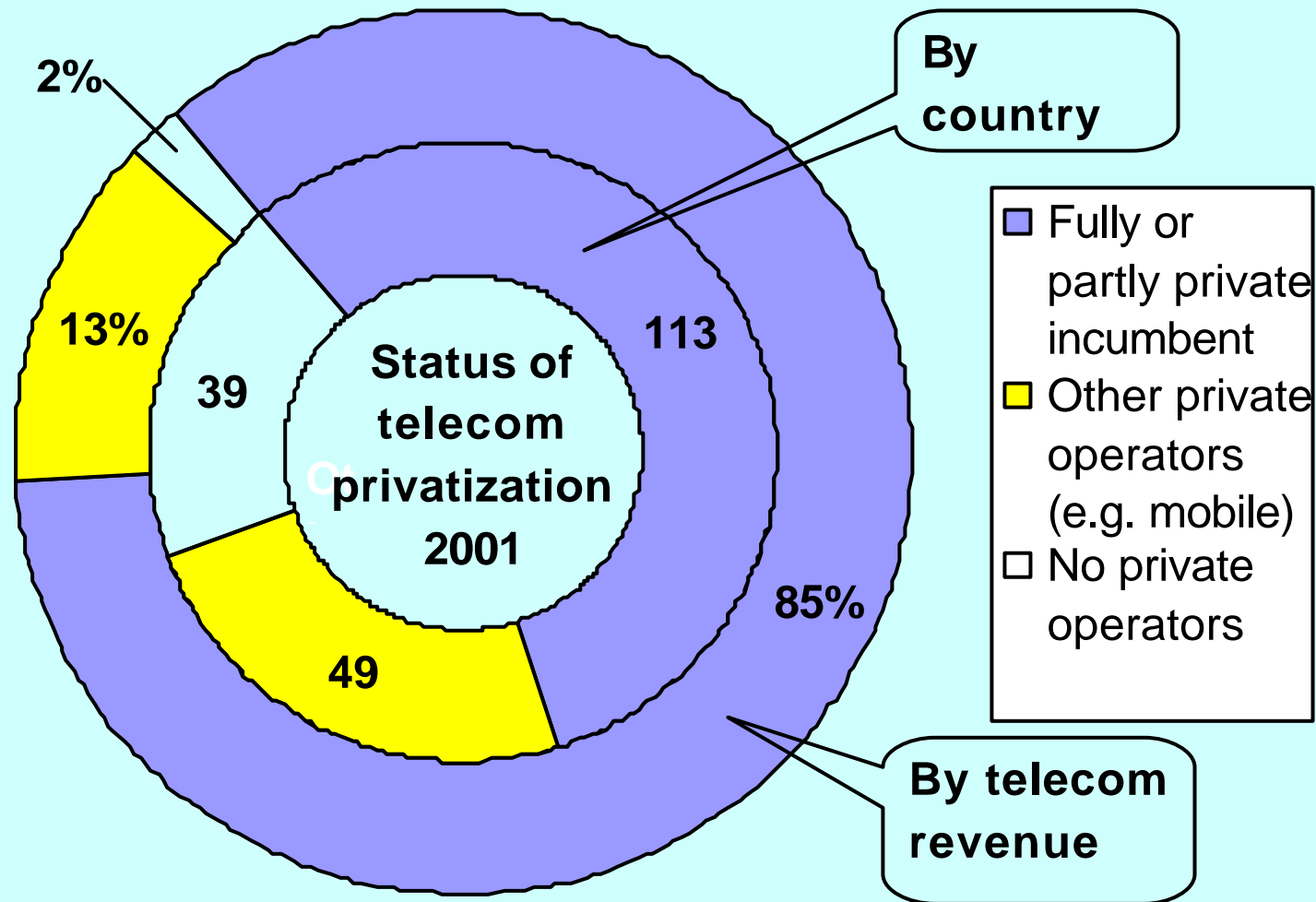
*Note: The views expressed in this presentation are those of the author and do not necessarily reflect the opinions of the ITU or its membership.*



## ***Agenda***

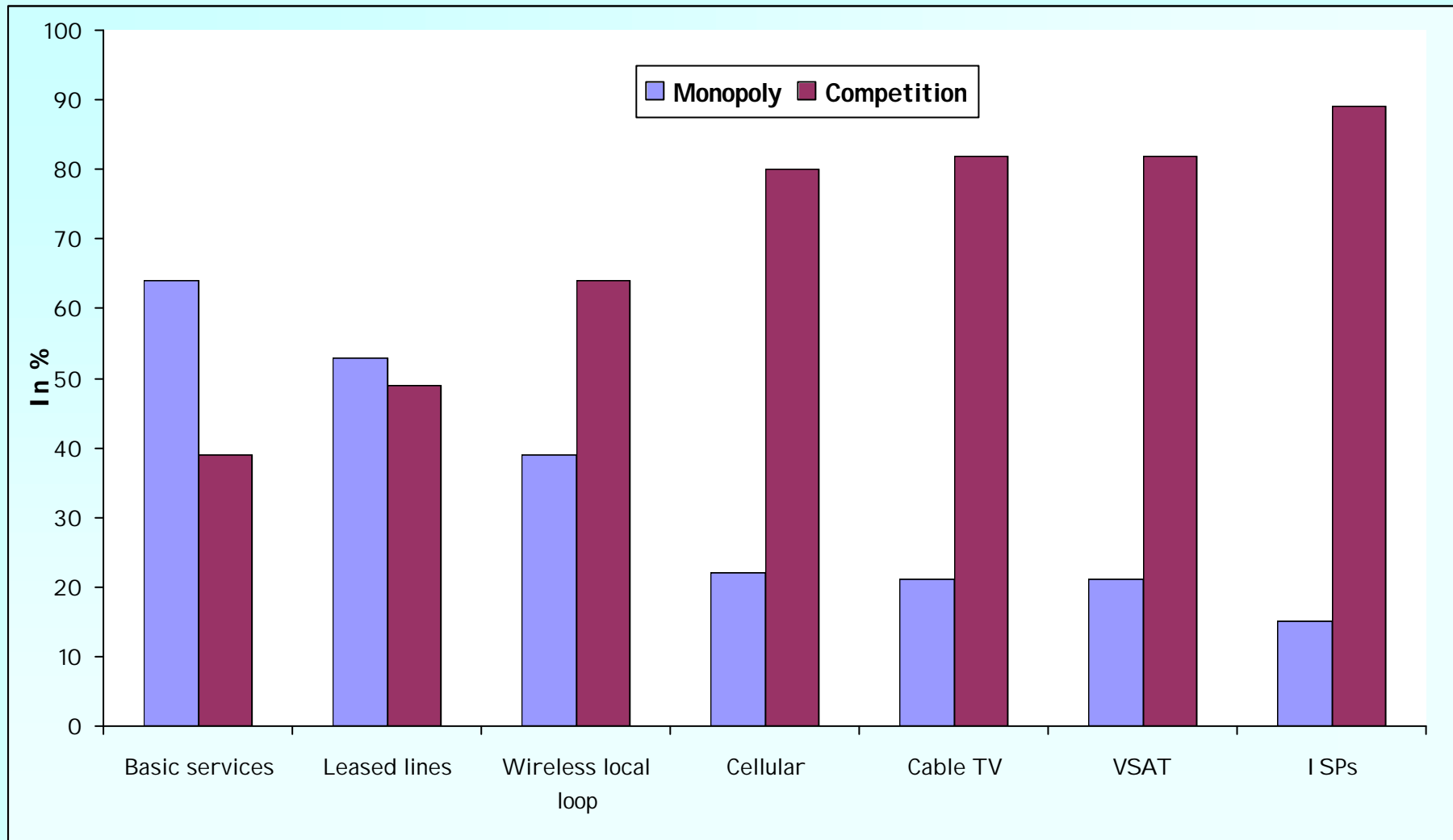
- **Status of competition**
  - ⇒ **Competition in Voice Telephony**
  - ⇒ **How traffic flow in the competitive market**
- **Role of Regulators**
- **Importance of Interconnection**
  - ⇒ **Regulatory and technical issues**
  - ⇒ **Economic issues**
- **Importance of tariff rebalancing**

# Private, competitive, mobile and global



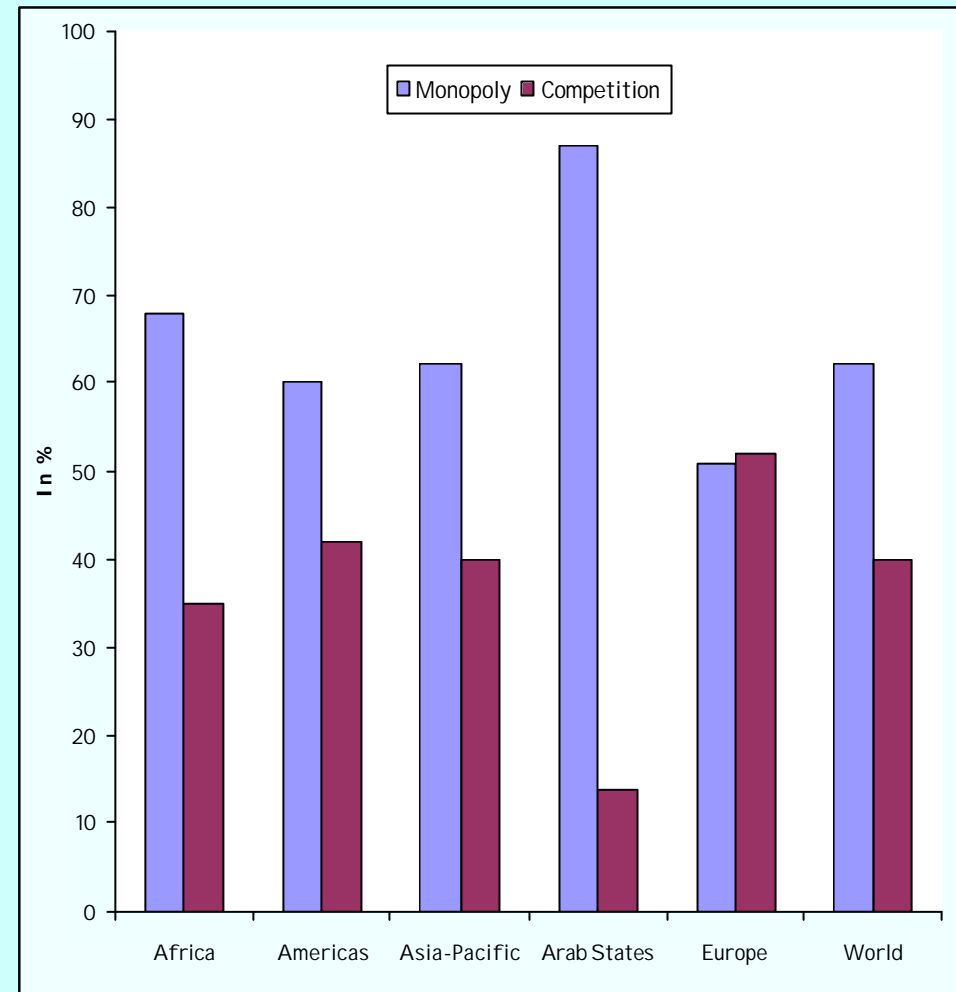
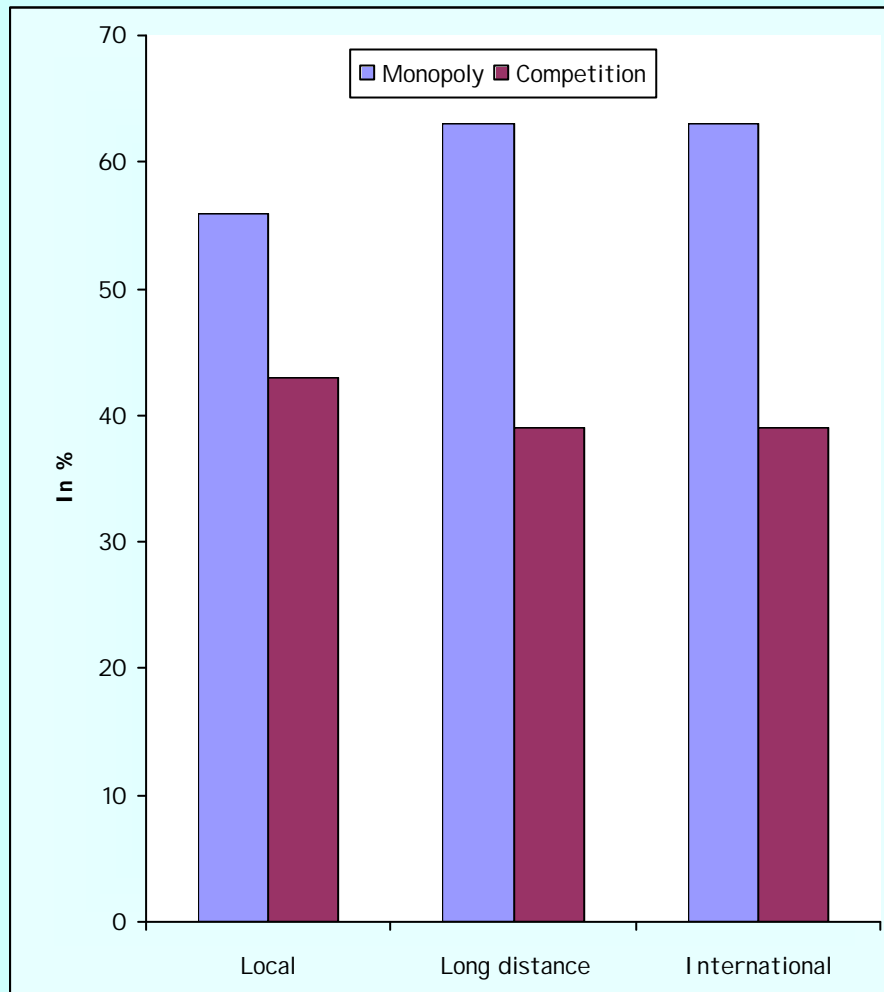
*Status of telecommunication privatization , by country and by share of global revenue, 2001*

# Percentage of countries with competition for selected services, 2001



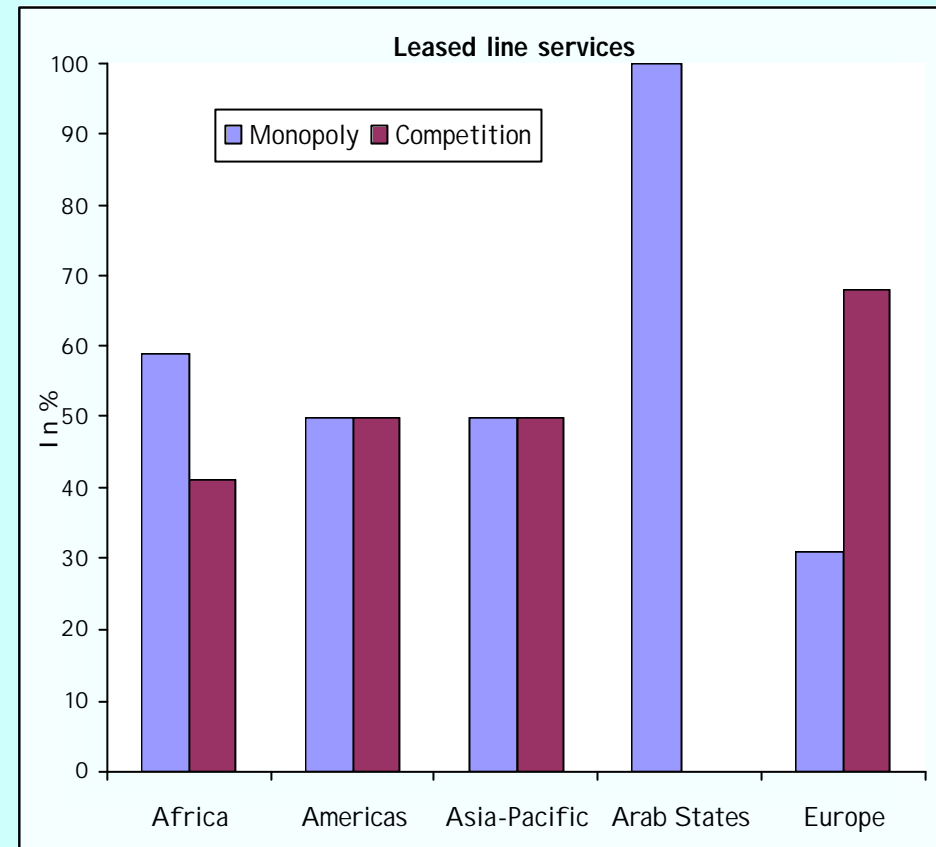
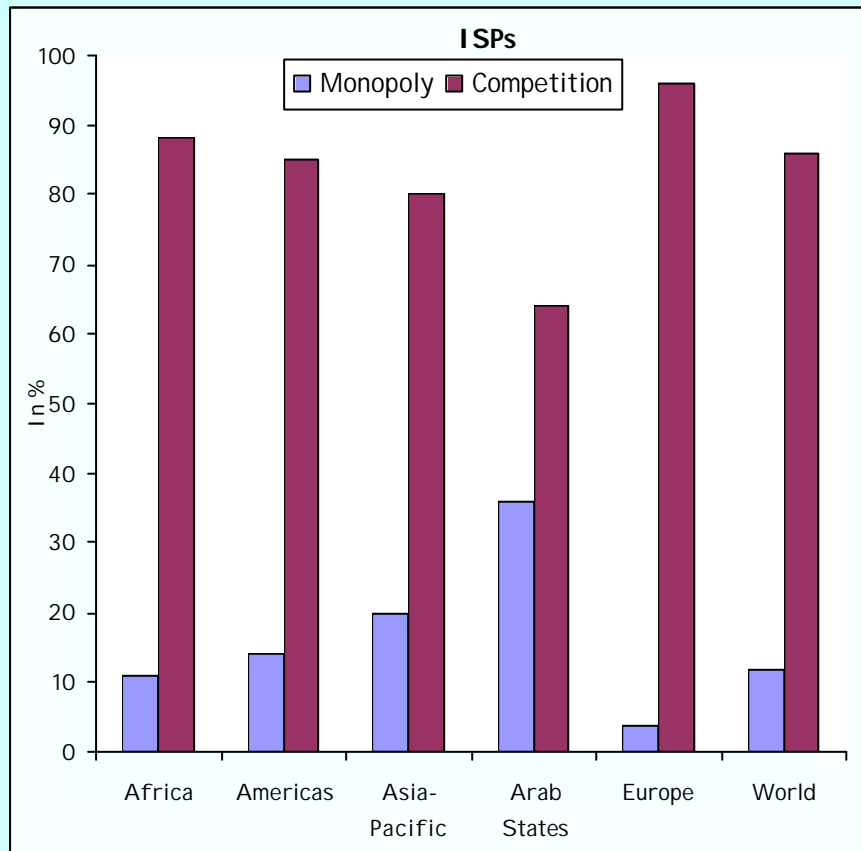
Source: ITU World Telecommunication Regulatory Database, 2001

# Percentage of countries allowing competition for basic services



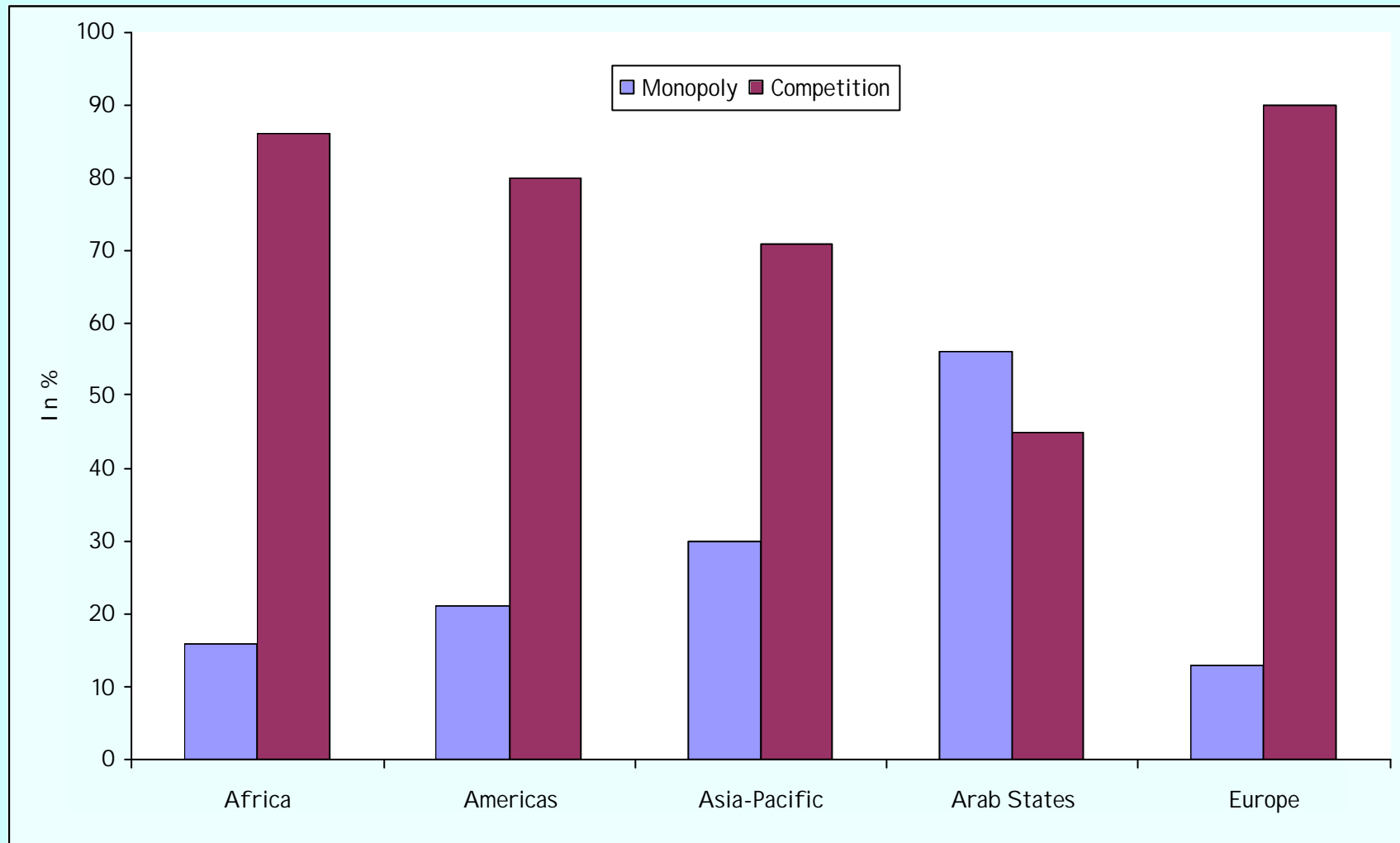
Source: ITU World Telecommunication Regulatory Database, 2001

# Competition in ISP and Leased Line Markets, by Region



Source: ITU World Telecommunication Regulatory Database, 2001

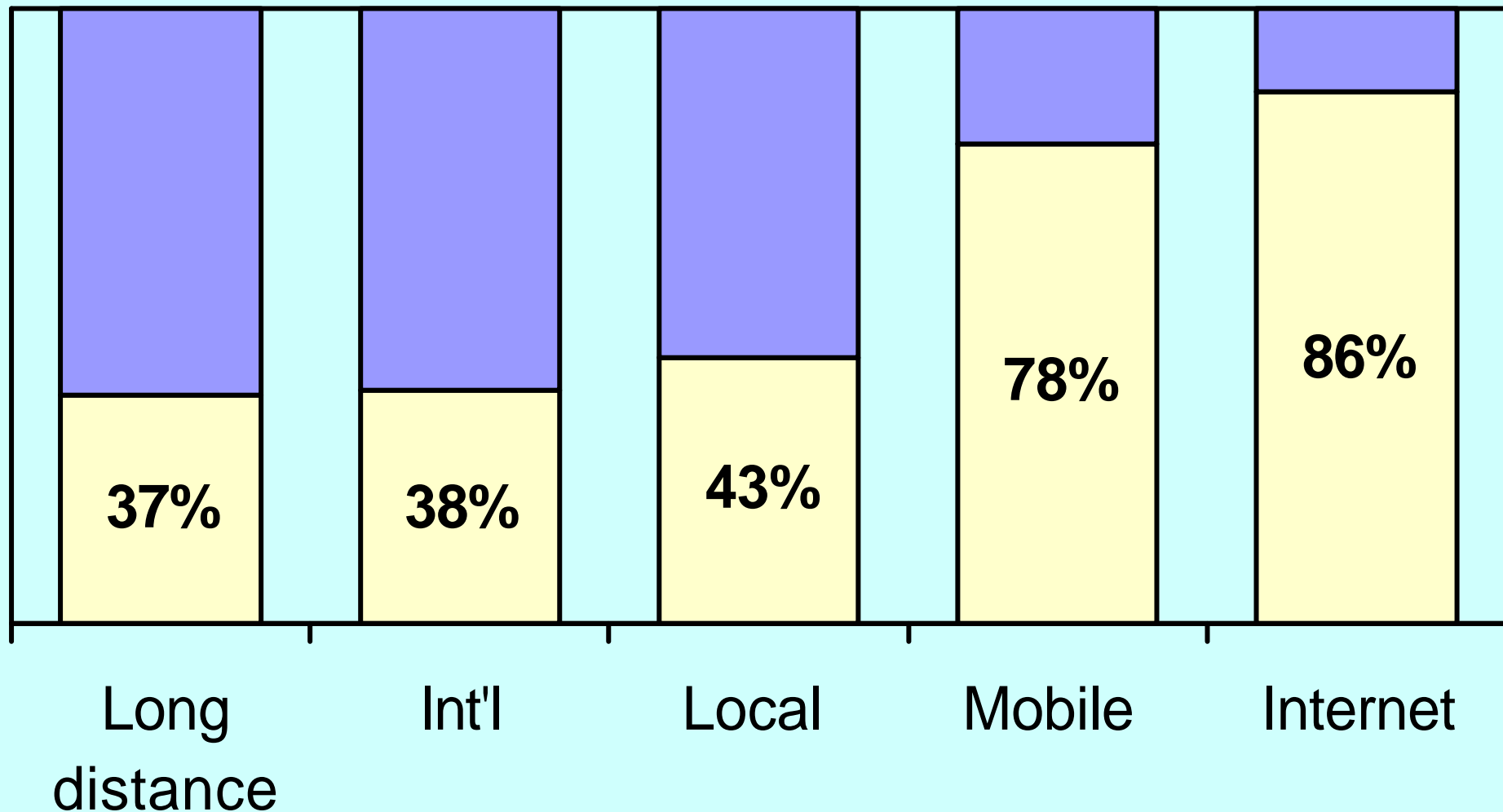
# Competition in Mobile Cellular Services



Source: ITU World Telecommunication Regulatory Database, 2001

# Legal status of competition Distribution by country, 2001

■ Monopoly  
■ Competition



*Legal status of telecommunication competition, by country, 2001*





Regional Profile - Europe & CIS

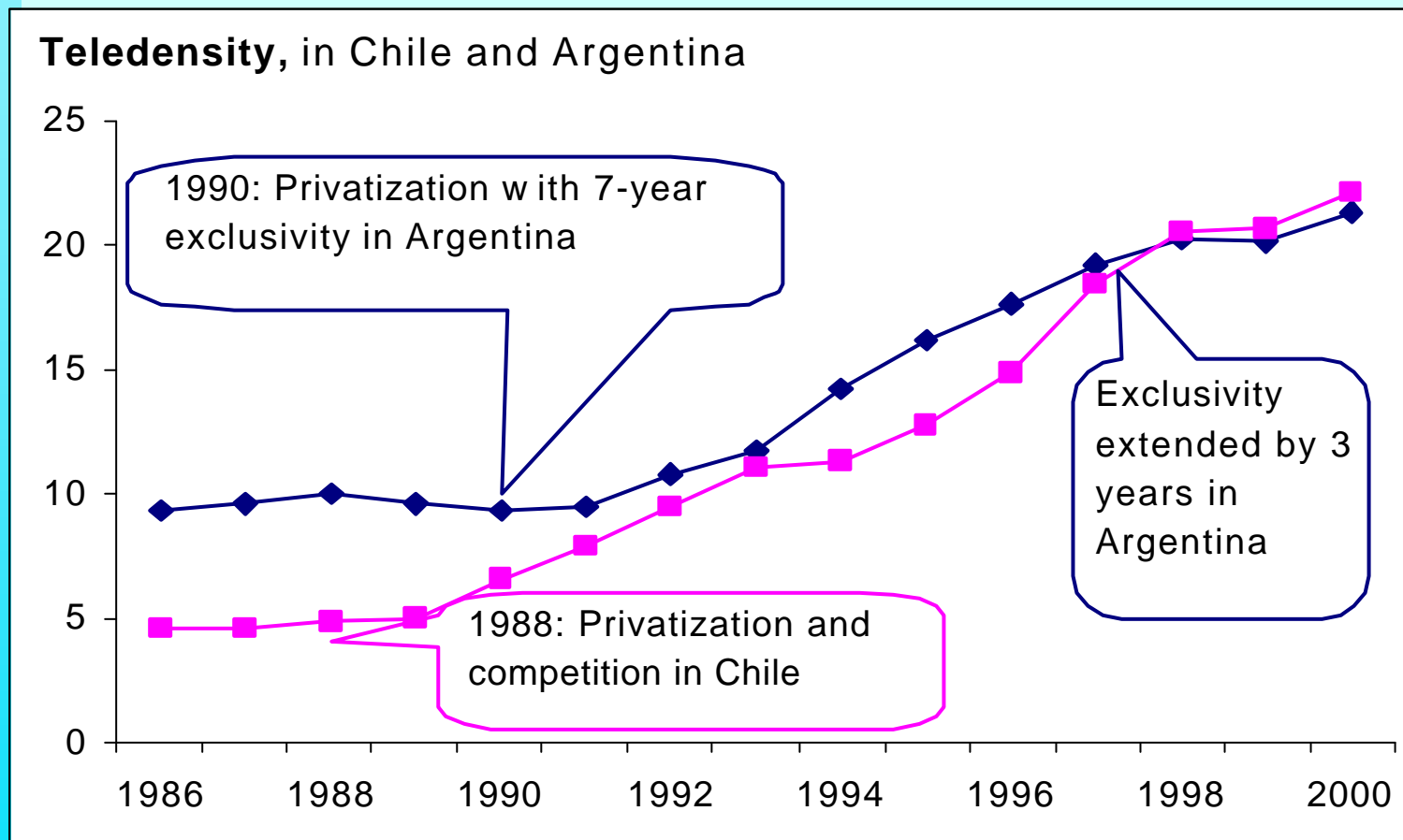
- Publications
- Address book
- Legislative information
- Profiles
- Documents
- Events
- Related Websites
- About TREG/RRU

Level of Competition

Country	Local services	Domestic long dist	Intl long dist	XDSL	Wireless local loop	Mobile analog	Mobile digital	Leased lines	Data	VSAT	Paging	Mobile sat	Fixed sat	Cable TV	GMPCS	IMT 2000	ISP
Albania	M	M	M	...	P	...	C	C	C	C	C	...	C	C	C	...	C
Andorra(2)	M	M	M	...	...	M	M	M	M	...	M	M	...	D	...	...	...
Armenia	M	M	M	...	M	M	M	M	C	...	M	M	M	M	...	...	C
Austria	C	C	C	C	C	...	C	C	...	C	C	C	C	C	C	C	C
Remarks: for up to date information about the numbers of operators see www.rtr.at.																	
Azerbaijan (2)	P	M	M	M	M	C	C	P	P	...	C	P	M	C	...	...	...
Belarus	P	M	M	M	C	M	P	P	C	M	C	M	M	C	...	M	C
Belgium	C	C	C	C	P	P	P	C	C	C	P	C	C	...	C	P	C
Bosnia and Herzegovina	M	M	M	...	...	...	P	...	...	...	...	...	...	C	...	...	C
Bulgaria	C	C	C	...	C	C	C	C	C	...	C	C	C	C	C	...	C
Croatia	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Cyprus	C	C	C	M	...	...	P	C	C	C	C	...	P	...	C	P	C
Czech Republic	C	C	C	C	P	P	P	C	C	C	C	C	C	C	...	P	C
Remarks: Cable Television + xDSL + cable data= n.a.																	
Denmark	C	C	C	C	C	M	P	C	C	C	...	C	C	C	C	P	C
Remarks: Paging and mobile analog: not relevant.																	

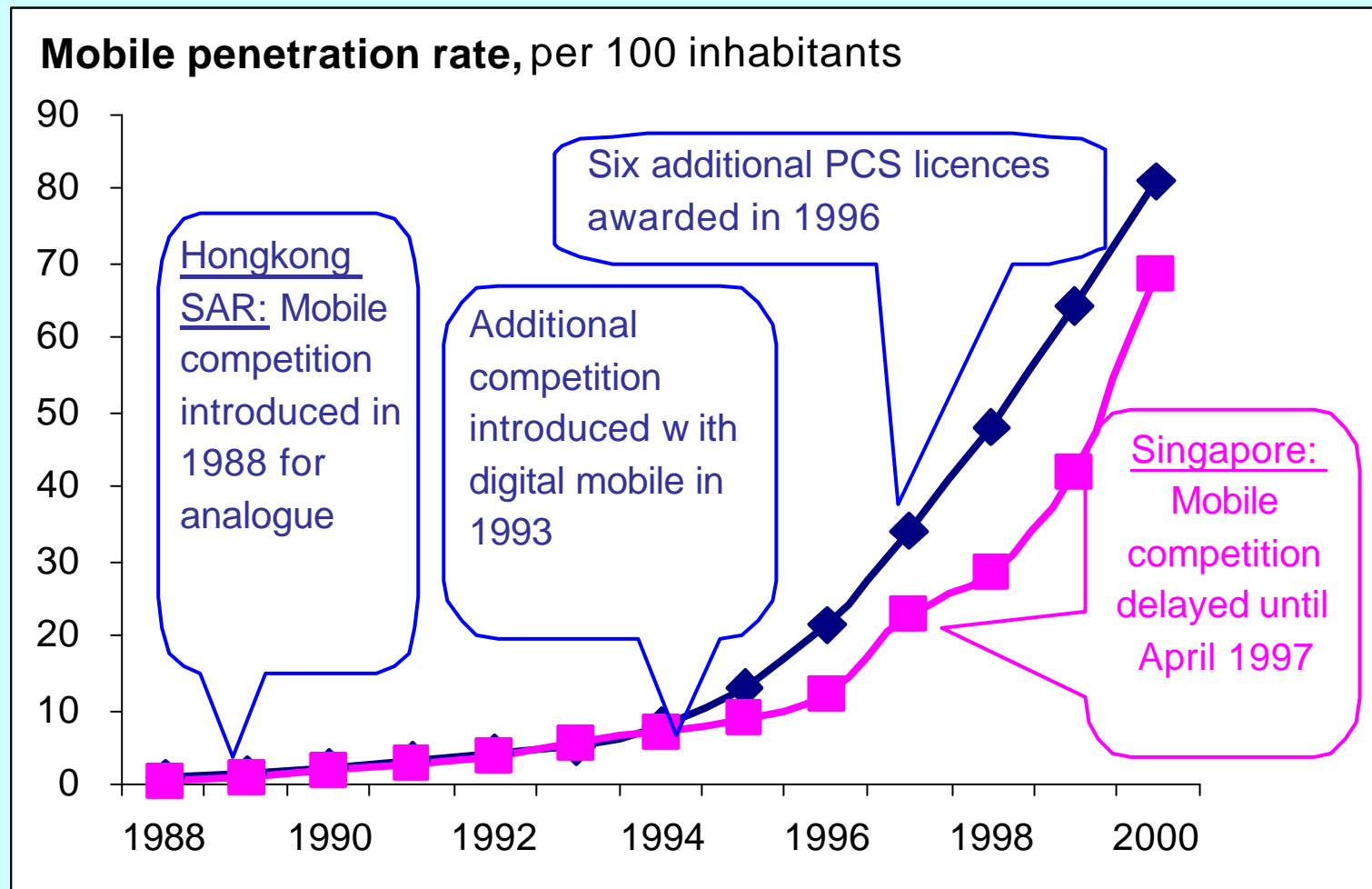


## Growth in fixed line teledensity, Chile and Argentina, 1986-2000





## Growth in mobile teledensity, Hong Kong SAR and Singapore, 1988-2000



## Teledensity with rising rank

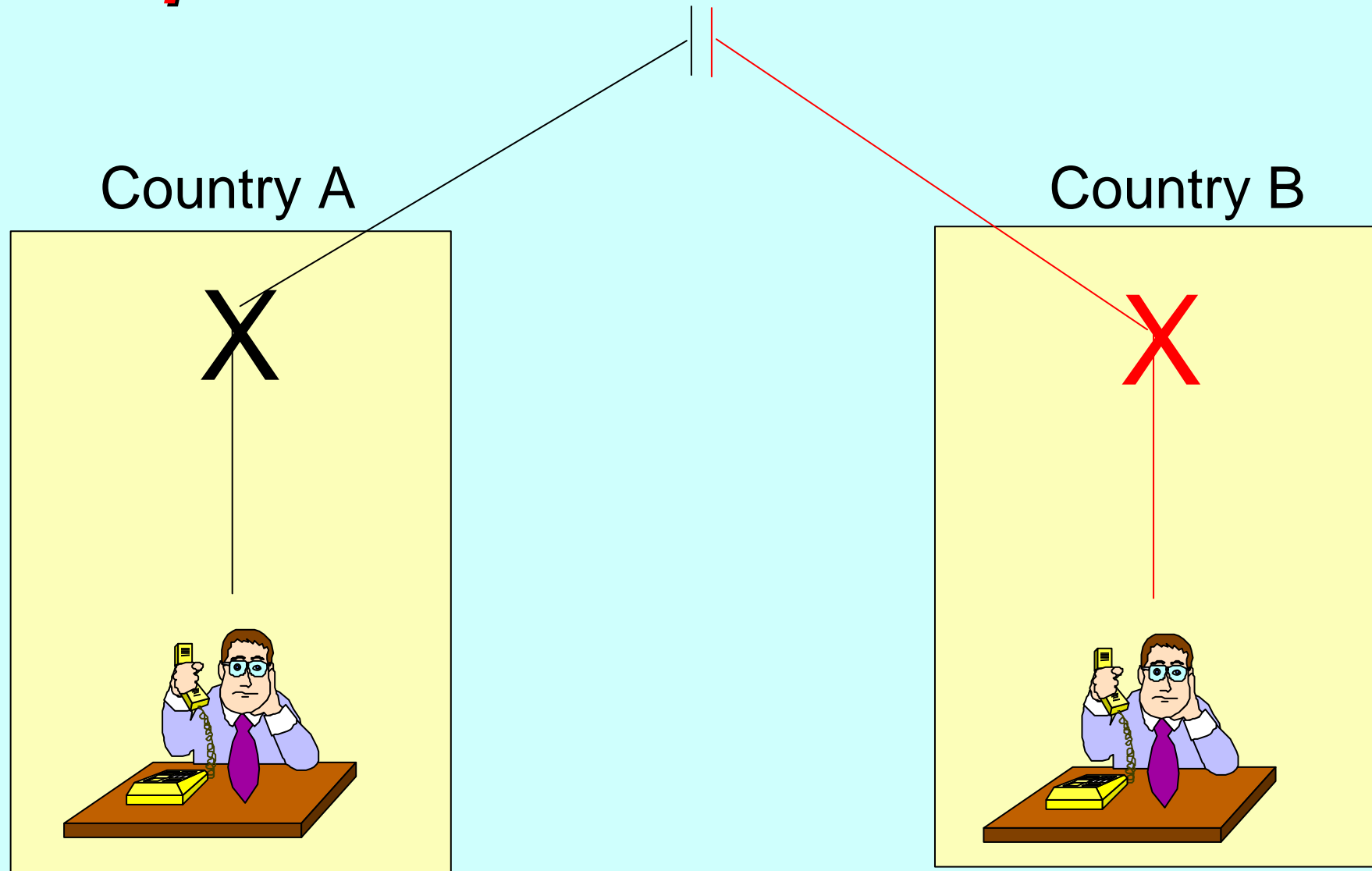
<b>Country</b>	<b>2000</b>	<b>1990</b>	<b>Rank 2000</b>	<b>Rank 1990</b>	<b>Change</b>
China	17.8	0.6	95	159	64
Viet Nam	4.2	0.1	141	189	48
Botswana	21.6	2.1	91	129	38
El Salvador	21.8	2.4	90	125	35
Jamaica	34.1	4.5	71	106	35
Hungary	67.4	9.6	43	78	35
Mauritius	38.6	5.4	67	100	33
Chile	44.4	6.7	61	93	32
Philippines	12.4	1.0	112	143	31
Morocco	13.3	1.6	107	136	29
Paraguay	20.7	2.7	92	120	28
Cambodia	1.2	0.0	167	194	27
Cape Verde	17.2	2.4	98	125	27
Taiwan, China	137.0	31.4	5	31	26
Poland	45.6	8.6	60	85	25

## Teledensity with falling rank

Country	2000	1990	Rank 2000	Rank 1990	Change
Armenia	15.6	15.7	102	60	-42
Iraq	2.9	3.9	149	109	-40
Tajikistan	3.6	4.5	143	105	-38
Uzbekistan	6.9	6.9	128	92	-36
Kyrgyzstan	7.9	7.2	125	90	-35
Angola	0.7	0.8	177	146	-31
Liberia	0.2	0.4	190	162	-28
DPR Korea	4.6	3.8	138	111	-27
Canada	96.1	58.6	33	6	-27
Turkmenistan	8.4	6.0	123	97	-26
Cuba	4.4	3.1	140	115	-25
Moldova	16.5	10.6	99	74	-25
Kazakhstan	12.5	8.0	111	87	-24
Comoros	1.0	0.8	171	149	-22
Ukraine	22.7	13.6	87	66	-21

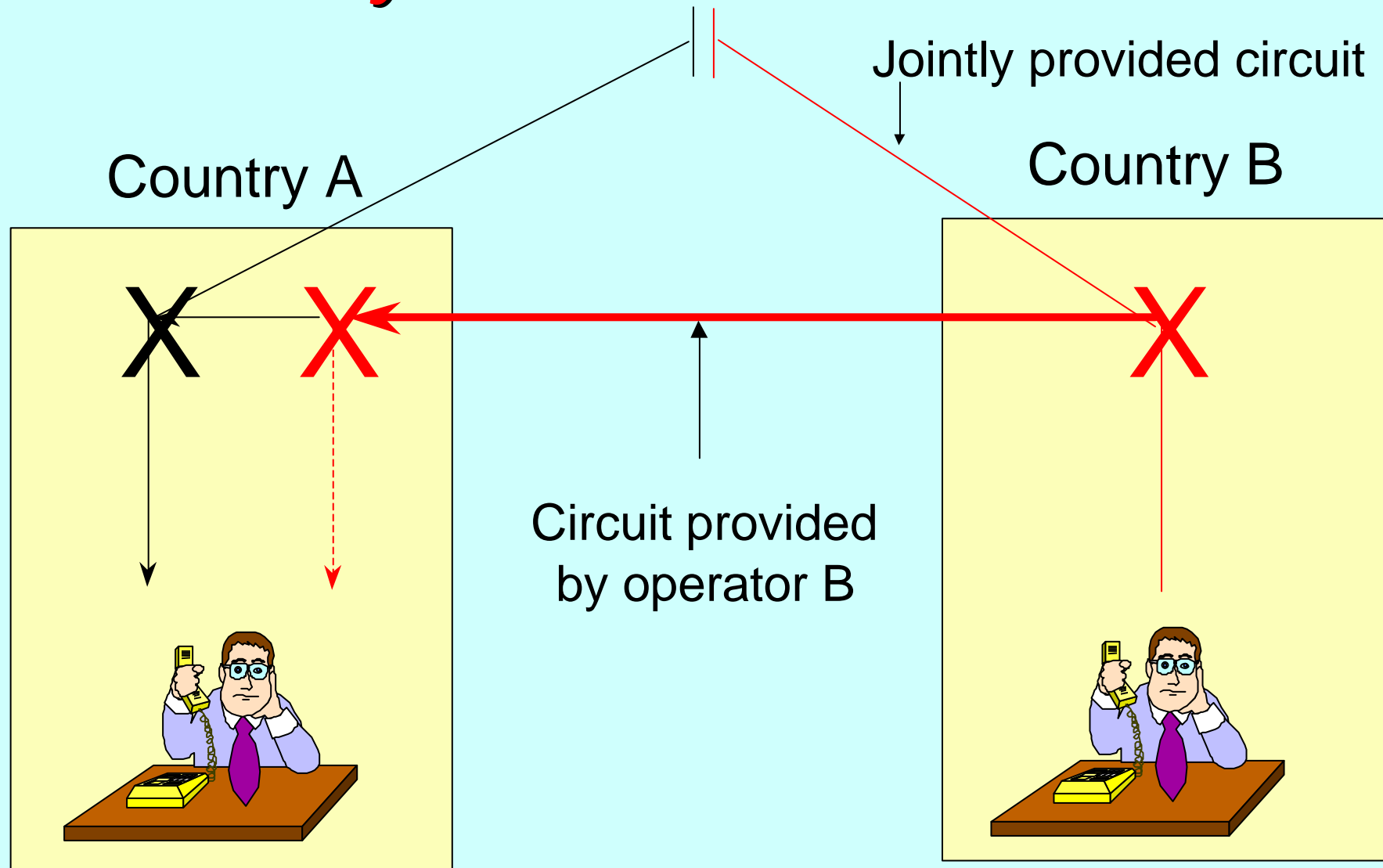
# ***Traditional regime: Joint provision of service***

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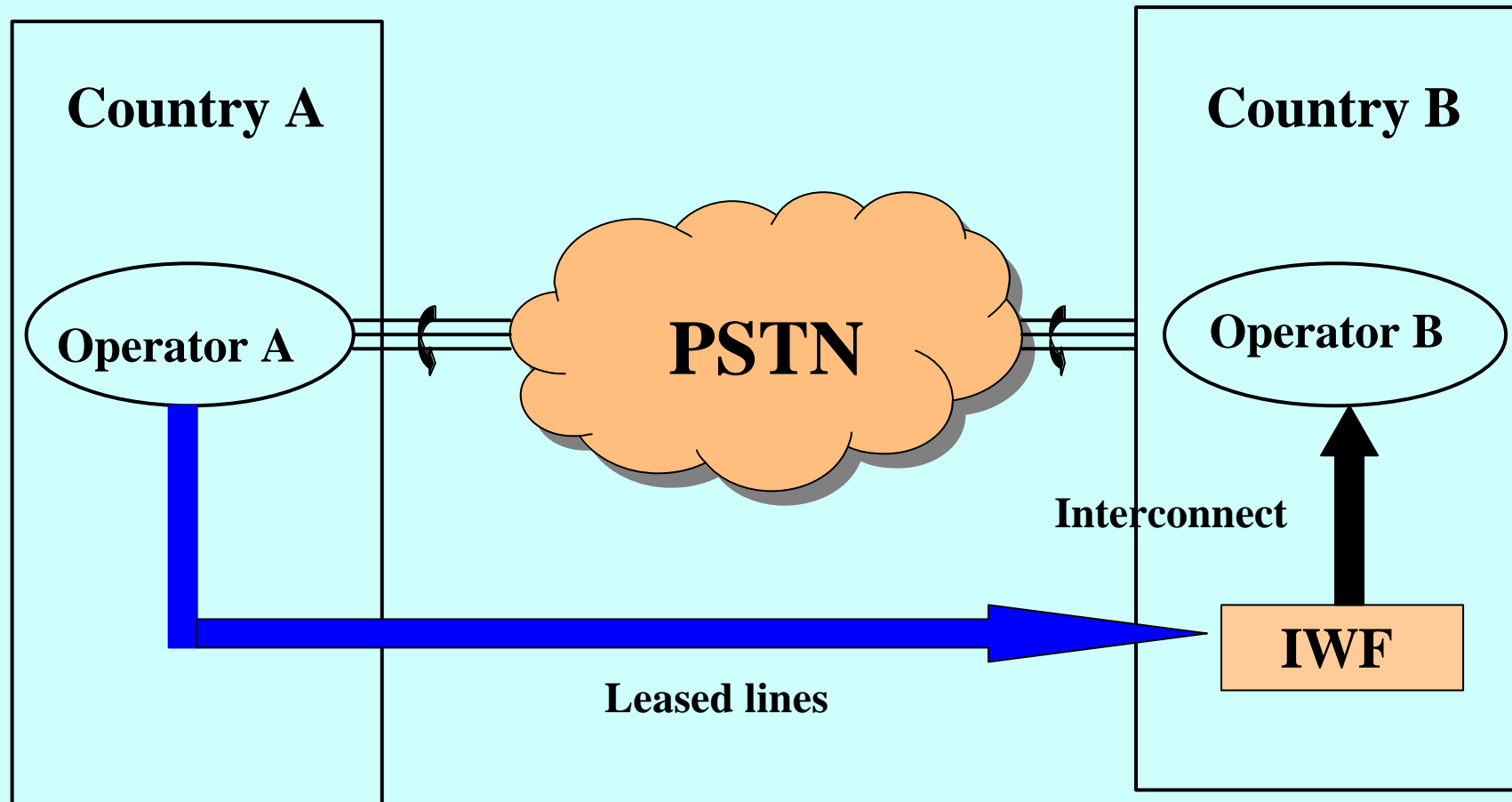


# ***Emerging regime: Market entry and interconnection***

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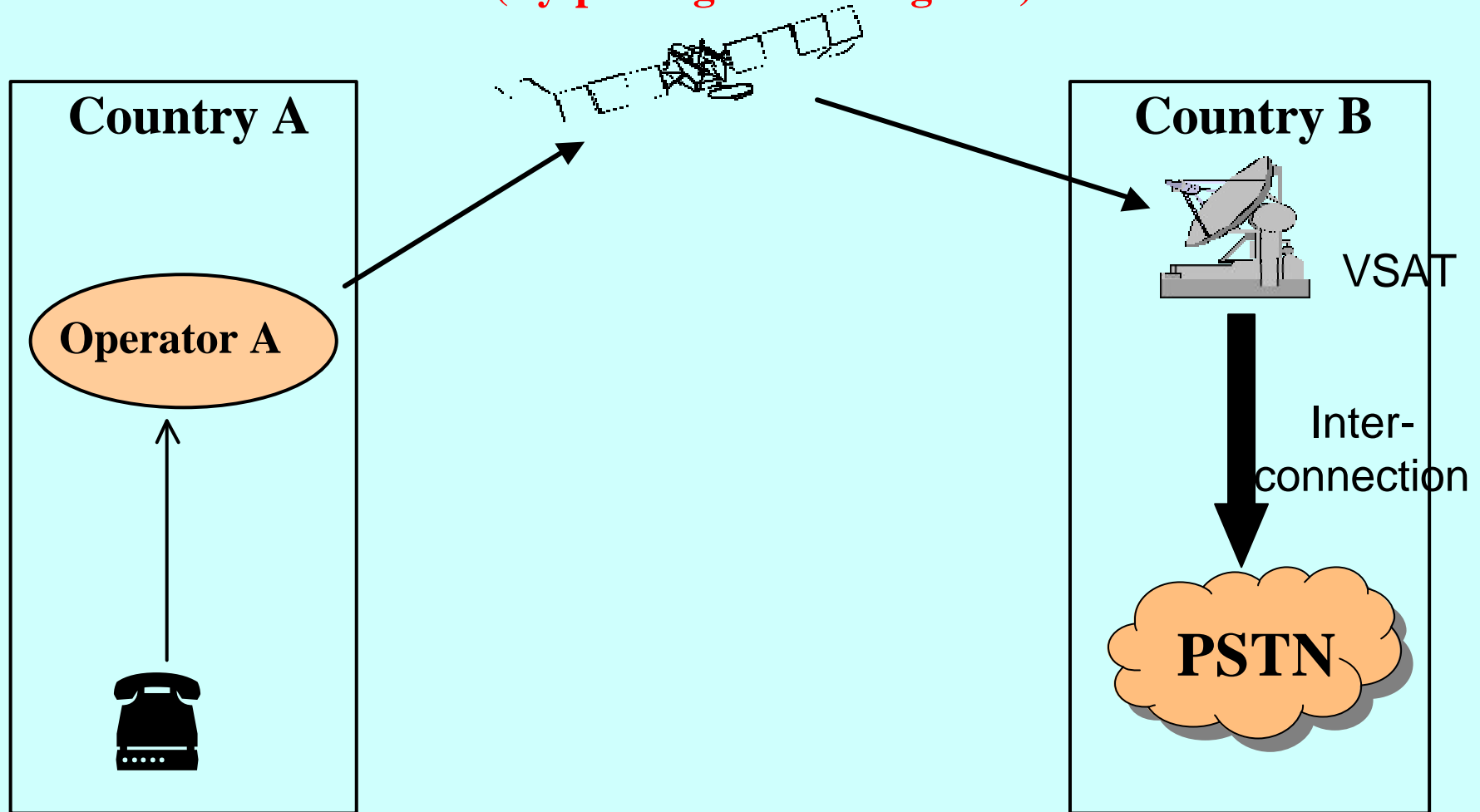
# International simple resale (ISR) (By-passing accounting rate)



Once a foreign carrier accepts the benchmark rate, it can negotiate ISR arrangements with US carriers

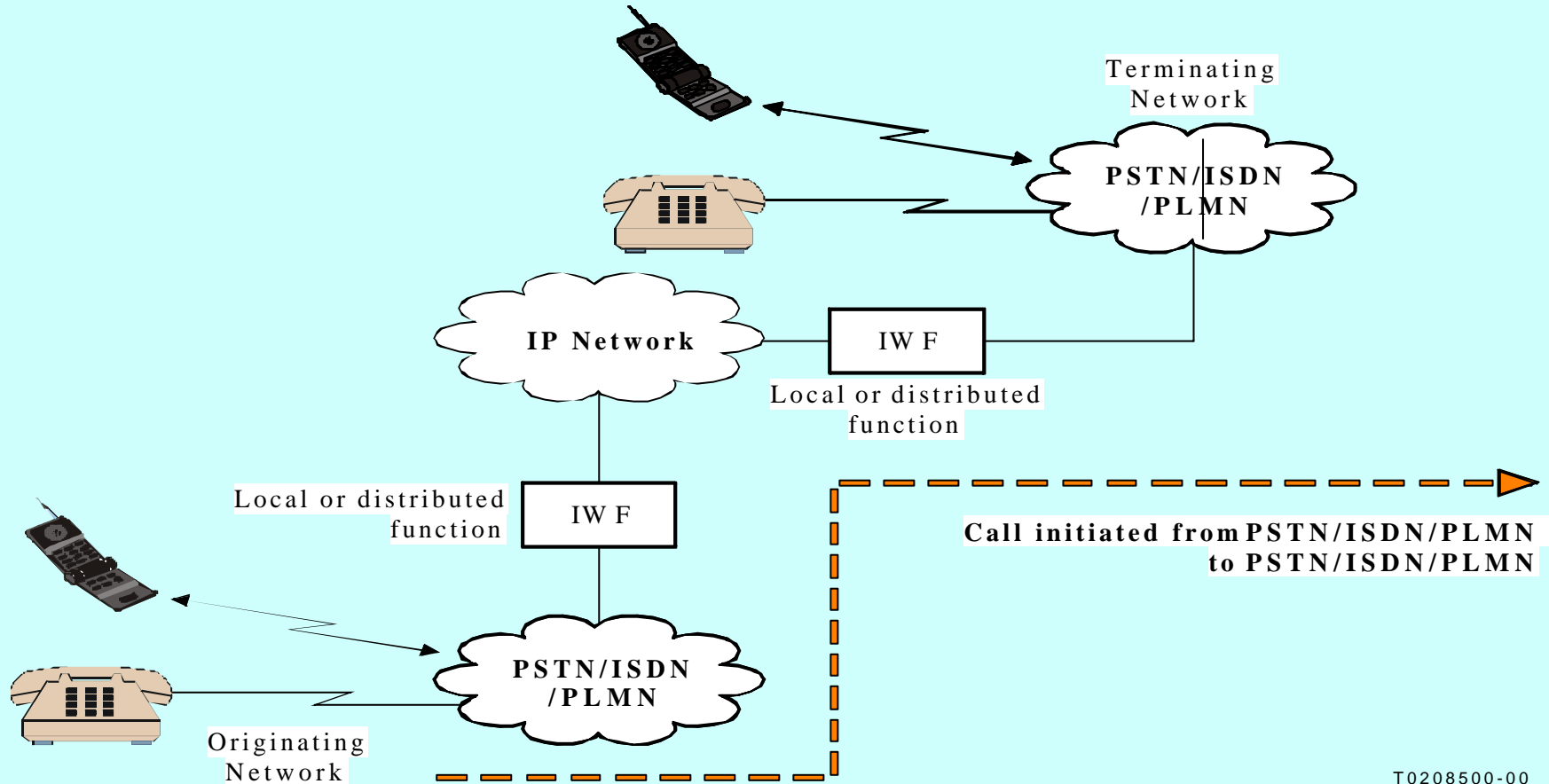


# Telephone service using data transmission (By-passing accounting rate)



Voice is packetized = data transmission  
Telephone regulations do not apply

# IP Telephony (by-passing accounting rate)



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(106147)

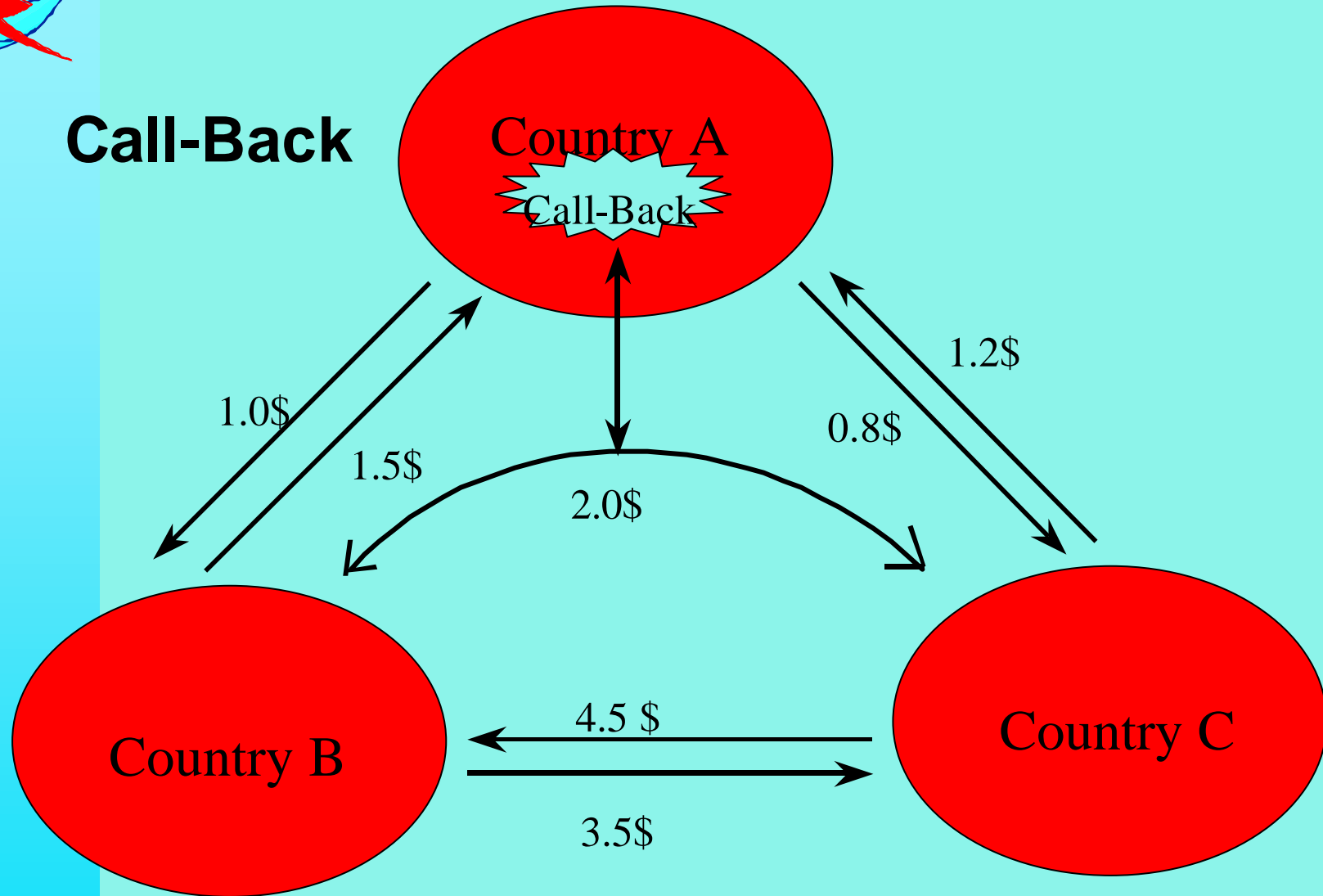
Call from International Telecommunication Network (ITN) to another ITN via IP-based Network



# CALL BACK using Accounting Rates

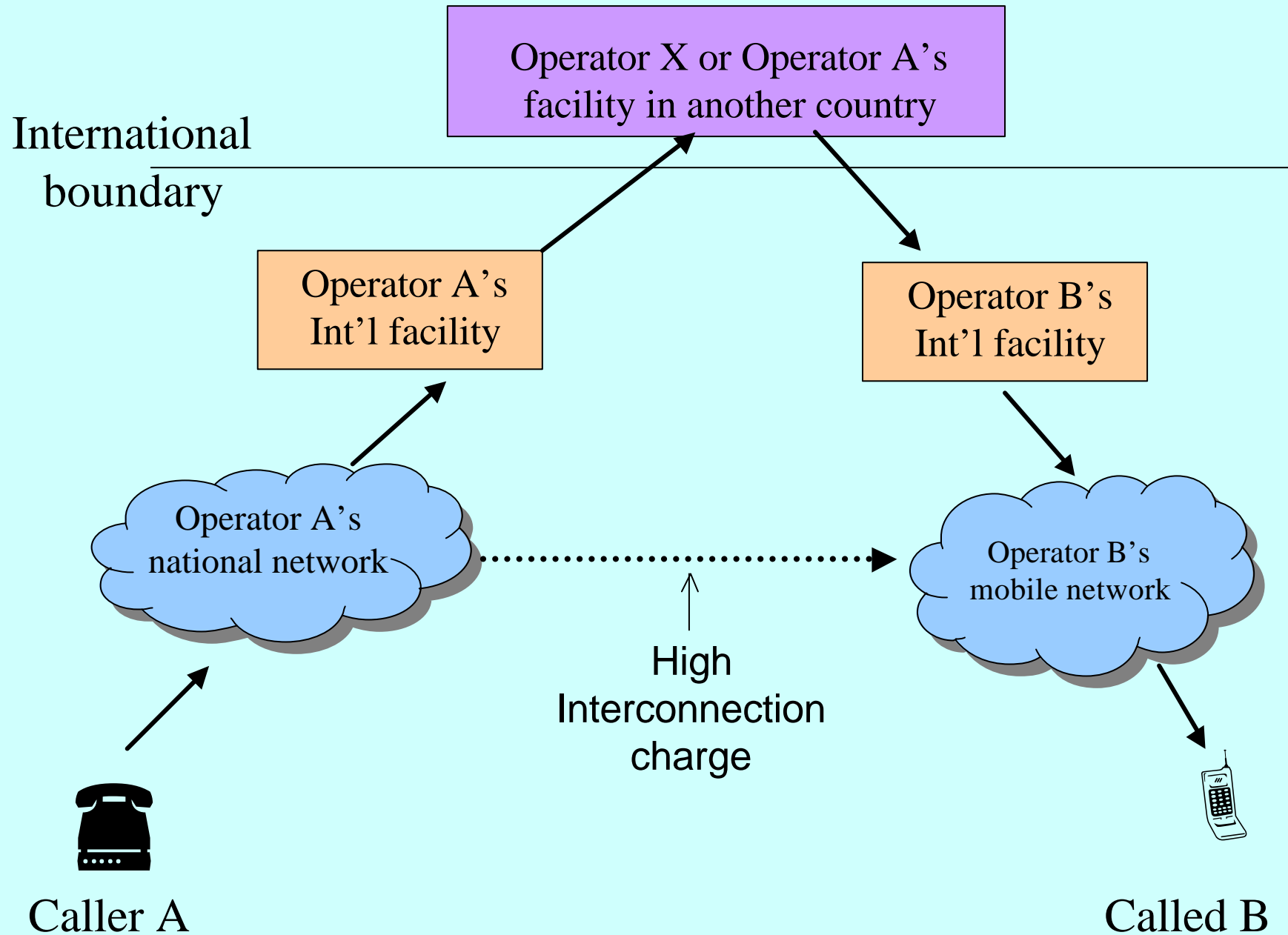


**Call-Back**



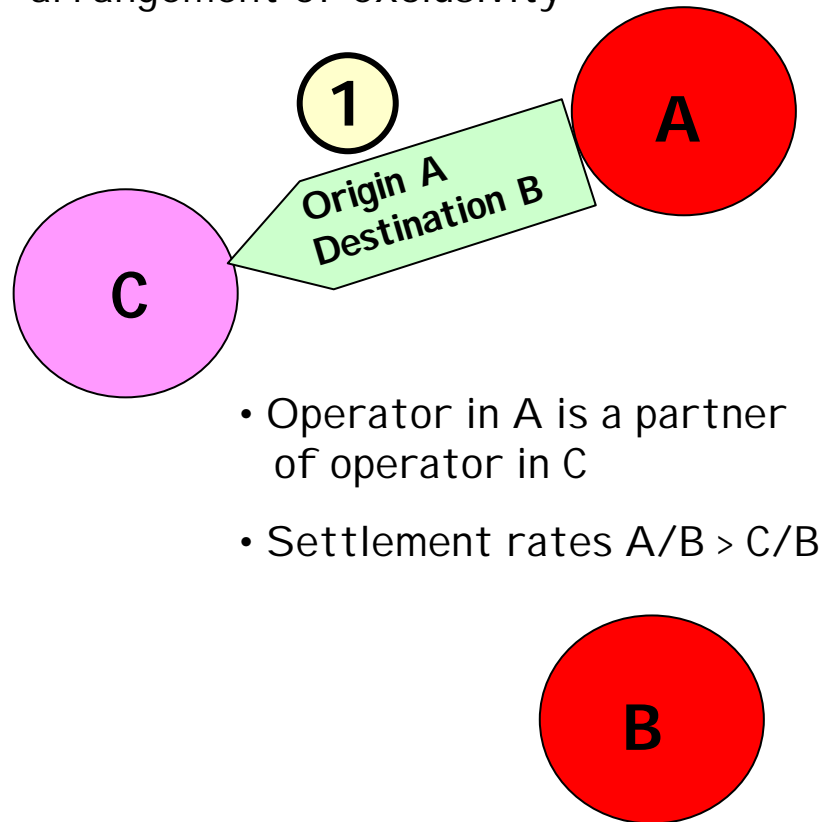
**Interconnection of two outgoing calls in country A**

# Mobile tromboning (using accounting rate)

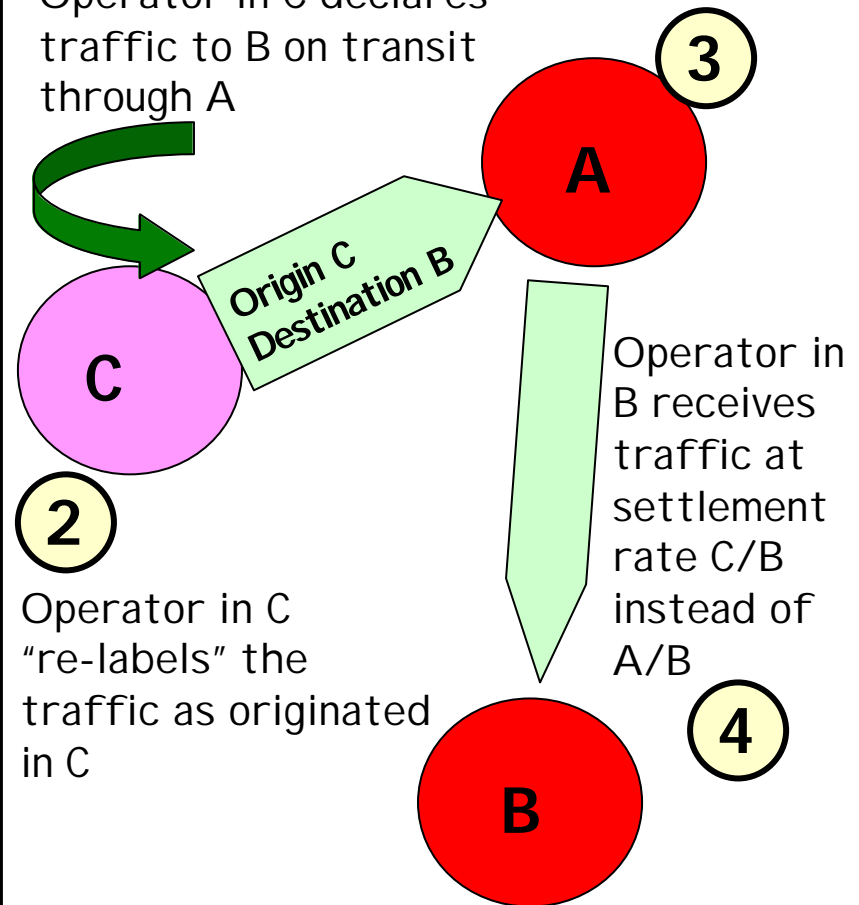


# Refile and other practices using accounting rate system

Operator in A sends traffic to operator in C under an arrangement of exclusivity

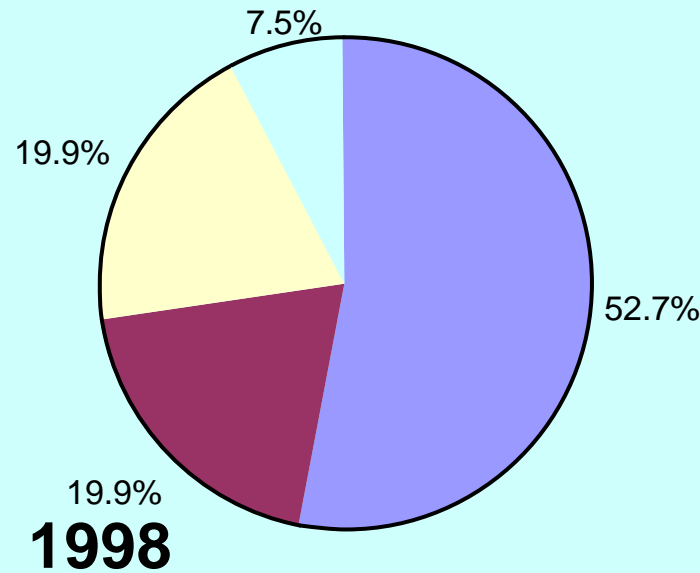
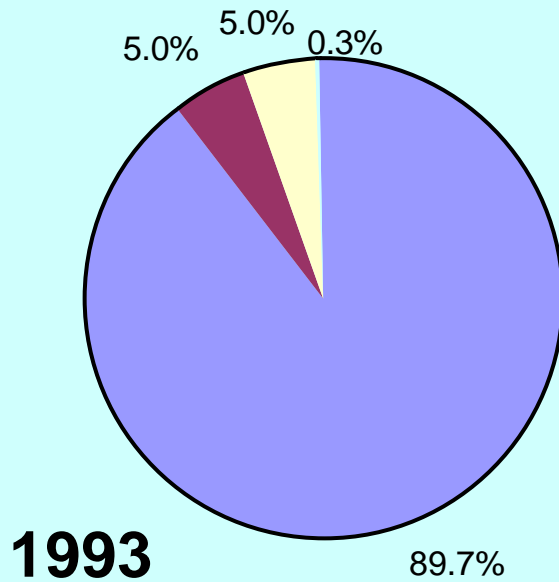


Operator in C declares traffic to B on transit through A

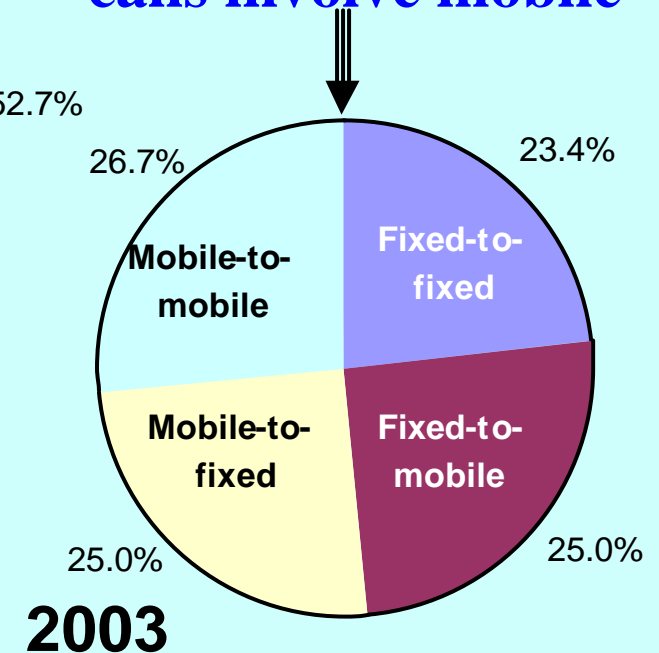




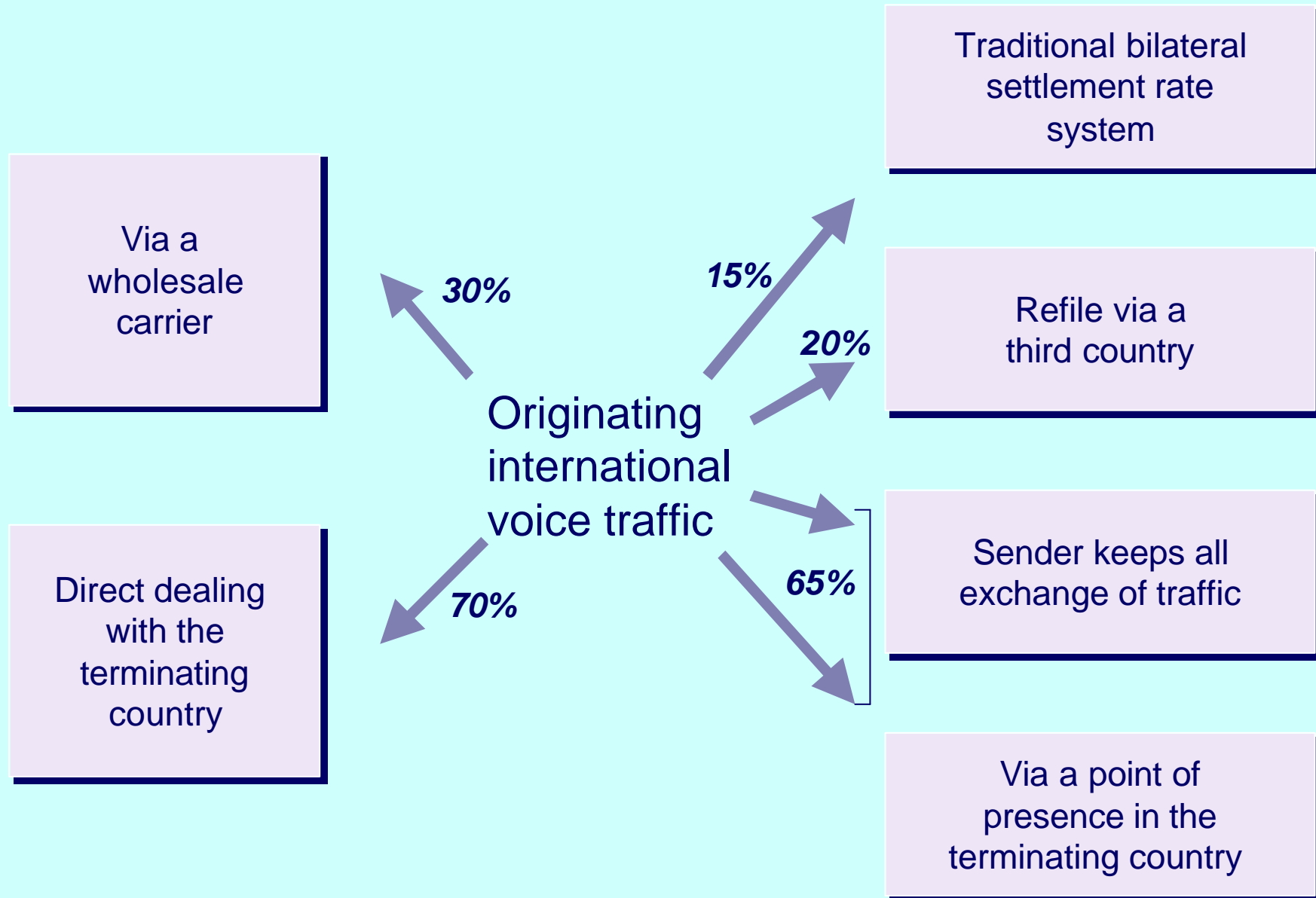
## Calling opportunity in the world



More than 75% of calls involve mobile



## *Delivering international voice traffic in 2002*



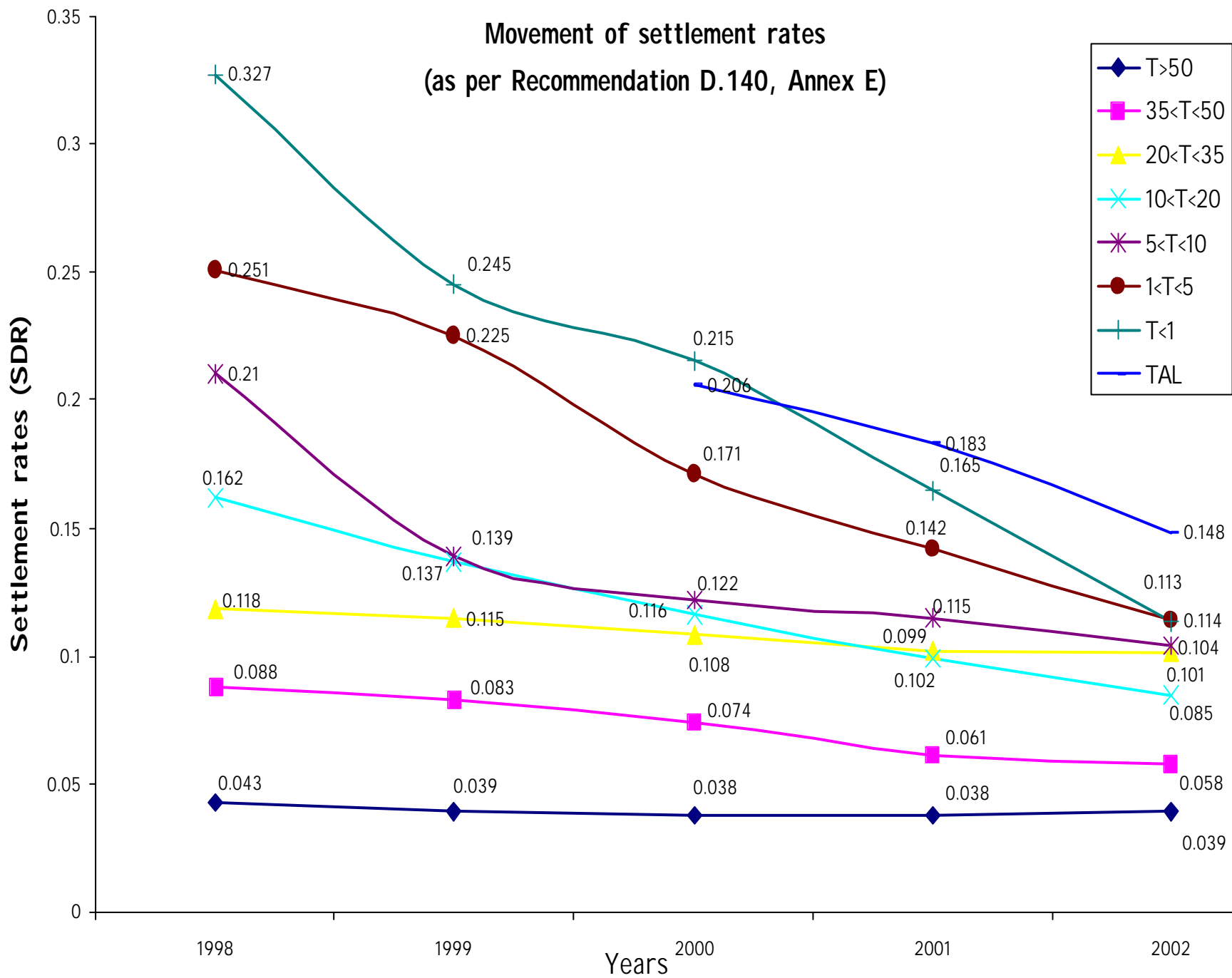


### ***So, what's the problem?***

- **Competition is everywhere but..**
  - ⇒ **Incumbents, New-comers and Regulators are not ready**
- **Accounting rates are the traditional way of sharing revenues from int'l services**
  - ⇒ **BUT, creates incentives among recipient countries to sustain rates at high level**
  - ⇒ **Accounting rate system not well-adapted to competitive market environment**
- **Strong pressure to move towards a cost-oriented system**
  - ⇒ **BUT, a cost-oriented system would be asymmetric**
  - ⇒ **US want cost-oriented but reject asymmetric charges for call termination**
- **How to calculate cost ?**
  - ⇒ **How interconnection charge should be determined**



Movement of settlement rates  
(as per Recommendation D.140, Annex E)





# ***Solutions & difficulties***

- **New Remuneration system (adopted)**
  - ⇒ **Termination charge system**
  - ⇒ **Settlement rate system**
  - ⇒ **Special arrangement**
- **Difficulty to quickly implement those systems**
  - ⇒ **Condition is to reach cost-oriented rate, but**
  - ⇒ **No cost data or model for some administrations ? SG3 developed principles and TAF, TAS, TAL cost models**
- **Transitional arrangements (review at WTSA)**
  - ⇒ **To facilitate staged reduction to cost based rate**
  - ⇒ **to avoid sudden fall of revenue (smooth transition)**
- **SG3 developed:**
  - ⇒ **Guidelines for negotiation**

# **Annex E to Recommendation D.140**

## **“indicative target rates” by Teledensity (T)**

### **Band, in SDR (and US cents) per minute.**

<b>T&lt;1</b>	<b>1&lt;T&lt;5</b>	<b>5&lt;T&lt;10</b>	<b>10&lt;T&lt;20</b>	<b>20&lt;T&lt;35</b>	<b>35&lt;T&lt;50</b>	<b>T&gt;50</b>
<b>0.327</b> <b>SDR</b>	<b>0.251</b> <b>SDR</b>	<b>0.210</b> <b>SDR</b>	<b>0.162</b> <b>SDR</b>	<b>0.118</b> <b>SDR</b>	<b>0.088</b> <b>SDR</b>	<b>0.043</b> <b>SDR</b>
<b>43.7¢</b> (end 2001)	<b>33.5¢</b> (end 2001)	<b>28.0¢</b> (end 2001)	<b>21.6¢</b> (end 2001)	<b>15.8¢</b> end 2001)	<b>11.8¢</b> (end 2001)	<b>5.7¢</b> (end 2001)
<b>Low income</b> <b>FCC : 23 ¢</b> (January 2002/2003)	<b>Lower middle</b> <b>FCC : 19 ¢</b> (January 2001)		<b>Upper middle</b> <b>19 ¢ (J.2000)</b>		<b>High income</b> <b>FCC : 15 ¢</b> (January 1999)	

Note: The correspondence between teledensity band and income group shown in the bottom row is intended to be approximate, not precise. Source: ITU-T SG3 Report. 1 SDR = US\$1.39.

# Guidelines to facilitate the negotiation

The following non-binding guidelines could be applied when negotiating accounting rates and accounting rates share in the international service:

1 Each party should ensure that; i.e., all information to be given to the other party should be credible in order to lead the negotiations into right direction.

2 The parties should negotiate freely and make agreements voluntary, any kind of coercion should be avoided.

Each party should act constructively, any offer, proposal, action, etc. should be directed towards reaching an agreement. Complex concepts should be simplified as much as possible.

4 Each party should act time-saving, any delay should be avoided.

5 Regular re-negotiations and future amendments should be possible.

6 Until such time as an appropriate dispute settlement arrangement may be approved by the ITU with respect to accounting rates, both parties should have the possibility to consult a person or institution for mediation.

## ***Addition to Recommendation D.140***

- 1** accounting rates for international telephone services should be cost-orientated and should take into account relevant cost trends;
- 2** each Administration should apply the above principle to all relations on a non-discriminatory basis; ***Accordingly, international calls should not be treated any less favorably than comparable national calls.***

***Alternative proposal from Vietnam:***

***Accordingly, under normal circumstances (where tariff rebalancing has been effectively achieved) international calls should be treated any less....***

# ***The importance of interconnection***

- **Key to developing competitive markets**
  - ⇒ **Interconnection is the main driver of growth and innovation in telecom market, it promote efficient infrastructure development**
  - ⇒ **But constructing a sound interconnection framework is no easy task**
- **Approaches to Interconnection Policy**
  - ⇒ **National approach – by 2000 101 countries had established interconnection regulatory framework**
  - ⇒ **Regional Approach – European Union (interconnection directive), CITELE (Guidelines and Practices for Interconnection Regulation), APEC (Recommended Principles for interconnection), TRASA(proposed interconnection guidelines)**
- **WTO Reference Paper on Regulatory Issues**
  - ⇒ **Puts forward a series of interconnection commitments:**
    - **provide interconnection at any technically feasible point**
    - **non discriminatory terms, conditions and rates**
    - **in a sufficiently unbundled and timely fashion**
    - **calls for transparency**

# ***Key Interconnection Rules in the WTO Reference Paper***

<b>Interconnection with “Major Suppliers” must be available</b>	<ul style="list-style-type: none"><li>- At any technical feasible point in the network</li><li>- In a timely fashion</li><li>- At cost orientated rates</li><li>- On non discriminatory and transparent terms</li><li>- On an unbundled basis</li><li>- At non-traditional interconnection points if requester pays charges</li></ul>
<b>Procedure</b>	<b>Procedures for interconnection to major suppliers must be made public</b>
<b>Transparency</b>	<b>Agreements of major suppliers’ model interconnection offers must be made public</b>
<b>Dispute resolution</b>	<b>An independent entity (which may be the regulator) must be available to resolve interconnection dispute within a reasonable time frame</b>



# **Regulatory and technical issues**

- **Policy makers must resolve such basic questions as:**
  - ⇒ **which carriers are required interconnection**
  - ⇒ **How the costs will be calculated and recovered, and**
  - ⇒ **At what points in the PSTN interconnection should occur**
- **Regulatory issues**
  - ⇒ **Establishing guidelines in Advance (without it, interconnection negotiation are frequently protracted, delaying the introduction of competition)**
  - ⇒ **Introducing competition require “dominant carriers” to interconnect with other carriers**
  - ⇒ **Cost orientation: excessive prices deter market entry, hinder competition, end user suffer and can provide a pool of revenue**
- **Technical issues**
  - ⇒ **Points of interconnection: incumbent operators permit interconnection with their networks at any technically feasible point**
  - ⇒ **Dialling Parity and Pre-selection: Call-by-call customer selection or Operator pre-selection by pre-subscription**
  - ⇒ **Quality of Interconnection Service**



# ***Economic issues***

The economic issues involved in interconnection largely come down to question of cost: cost definition, cost measurement, cost allocation and cost recovery

- **How can interconnection costs be measured?**
  - ⇒ **Theoretical Frameworks (Historical, Fully Distributed costs, LRIC)**
  - ⇒ **Cost study Approaches (Top-Down, Bottom-Up, Outside-In)**
- **Interconnection charge**
  - ⇒ **Cost based charges**
  - ⇒ **Retail-based charges**
  - ⇒ **Price Caps**
  - ⇒ **“Bill and Keep” or “Sender Keeps All”**
  - ⇒ **Revenue Sharing**

# Cost Model

## OBJECTIVES

### BUSINESS DECISION SUPPORT

- Pricing and Product Planning
- Investment evaluation
- Economics of direct/transit routing

### FINANCIAL CONTROL

- Monitor actual performance and compare with plan and past trends
- Cost control
- Identify Cross Subsidy

### REGULATORY COMPLIANCE

- Set D.140 as globally acceptable standard
- Rationalize tariff charges
- Derive TAR, USO

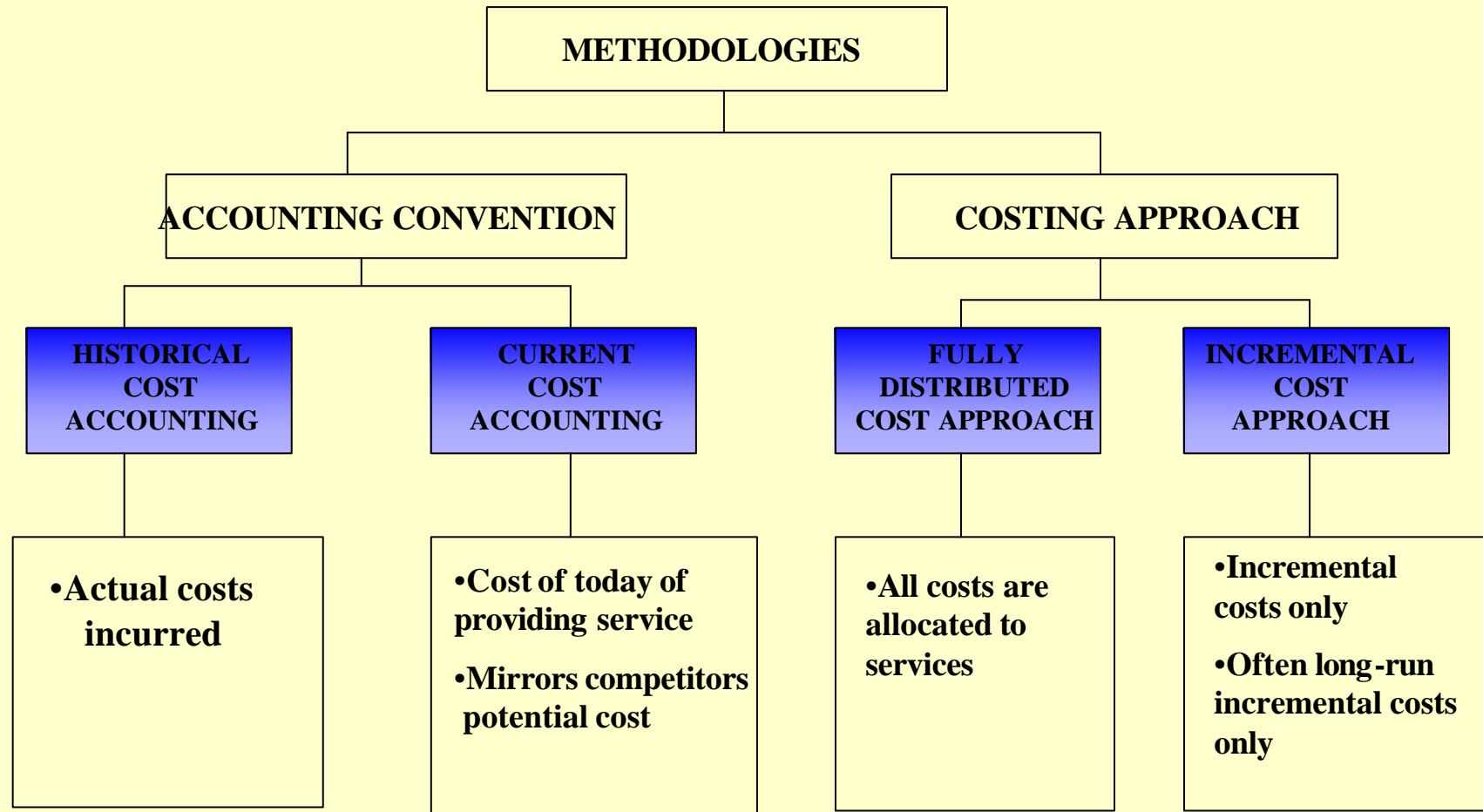
### MARKETING

- Minimize opportunity for arbitrage
- Generate more revenue by increased traffic

### TECHNOLOGY

- Enhancement towards global technology
- Long term cost/benefit of technology and options
- Impact of technology on global relations

# Costing Methodologies





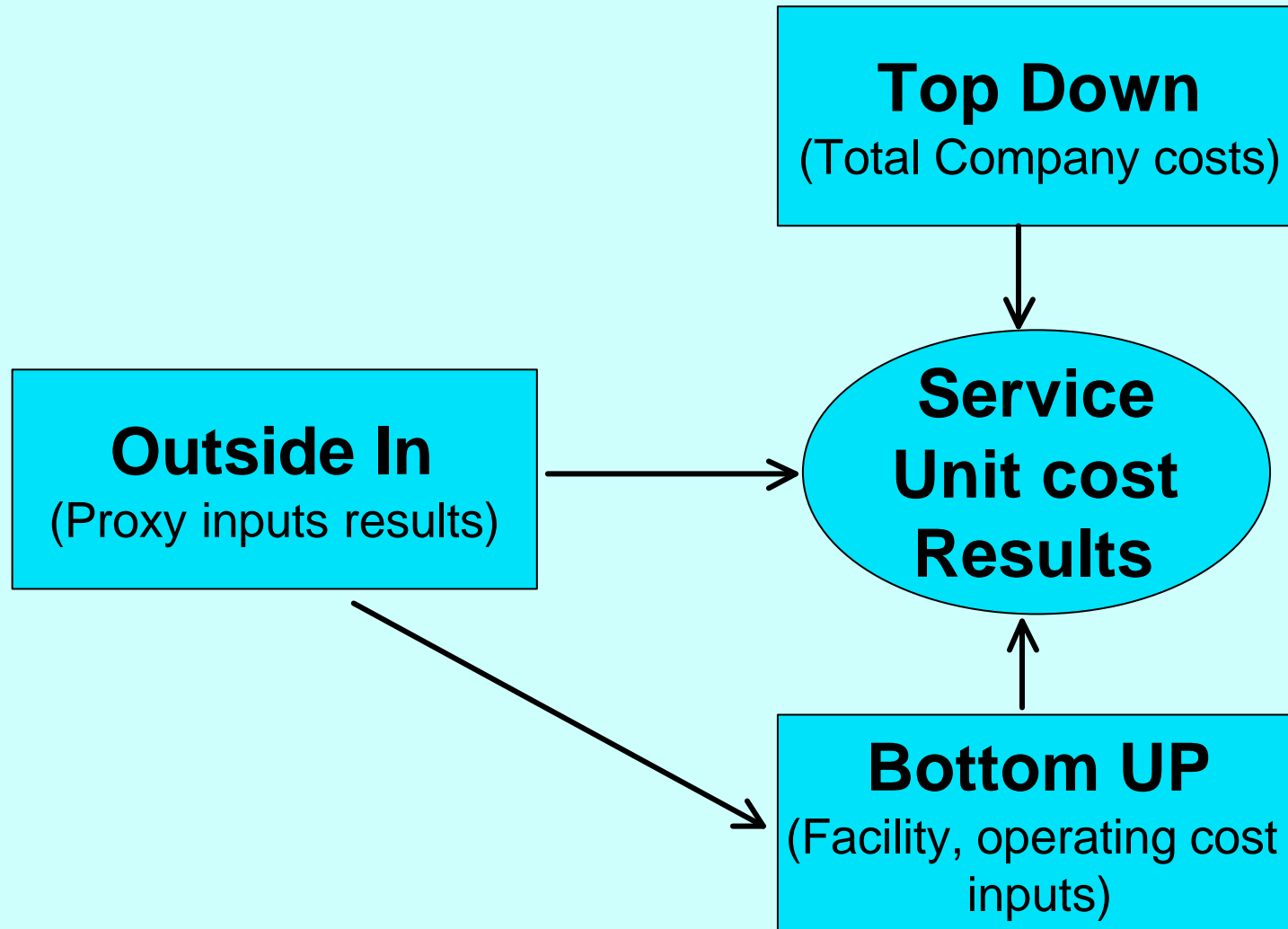
## ***No much differences if...***

- **Current cost accounting is used**
  - ⇒ **FDC=Historical Cost is no more relevant**
- **Costs of efficient services provision is used**
  - ⇒ **this should be the aim of all operators**
  - ⇒ **spare capacity (legitimate if transparency)**
  - ⇒ **Disagreement on time horizon to achieve this**
- **Principle of cost causality is applied (ABC)**
  - ⇒ **Common cost must be attributed to the service on the basis of the causality principle**
  - ⇒ **However an exhaustive application of an ABC approach may be very costly**
- **Need for cost recovery realised appropriately**
  - ⇒ **IC approach should contain a markup**

# Agreed General principles

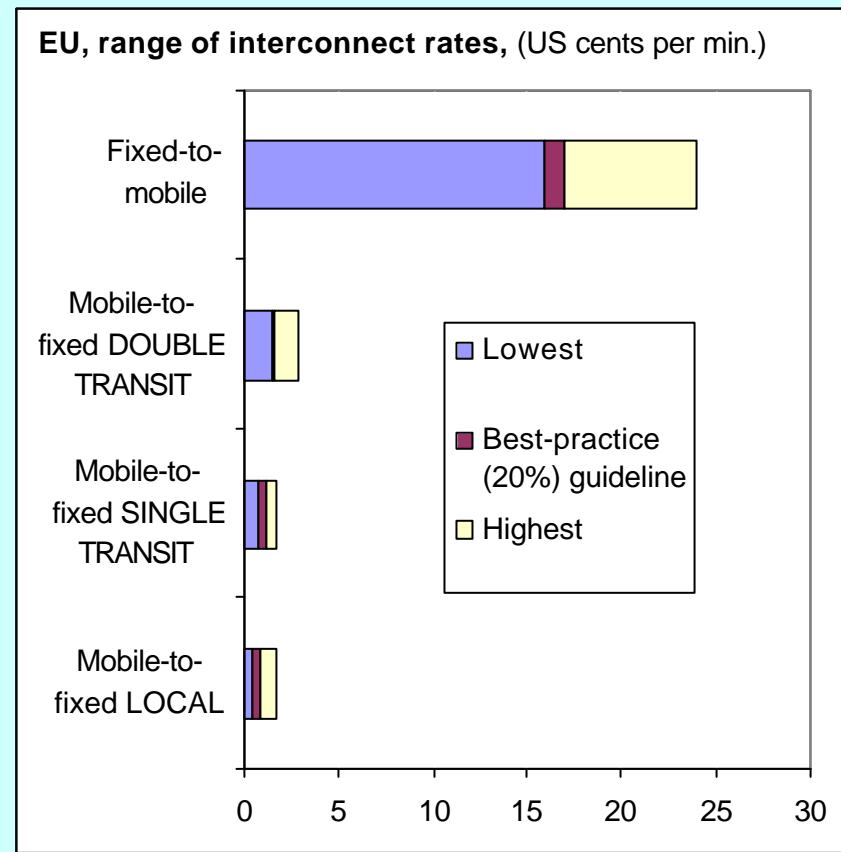
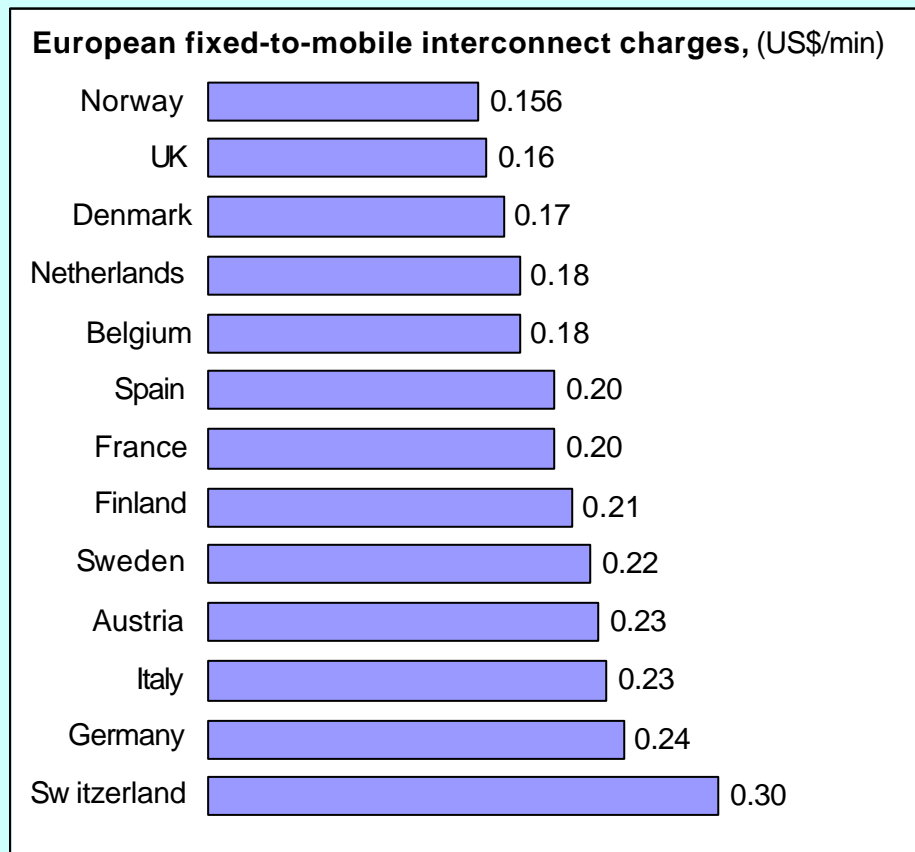
- **Principle of transparency** : *The open availability of information used in the cost deviation process in order to allow comprehension of the final rate from the vantage point of an external analyst*
- **Principle of practicability** : *The ability to implement a costing methodology with reasonable demands being placed on data availability and data processing in order to keep the costing exercise economical, yet still useful*
- **Principle of cost causality** : *The demonstration of clear cause-and-effect relationship between service delivery on the one hand and the network element and other resources used to provide it on the other hand, taking into account the relevant underlying cost determinants (cost drivers)*
- **Principle of reasonable contribution to common costs** : *Costing methodologies should provide for a reasonable contribution to common costs*
- **Principle of efficiency** : *The provision of a forecast of cost reductions that result from a more efficient combination of resources*

# Cost Study Methodologies



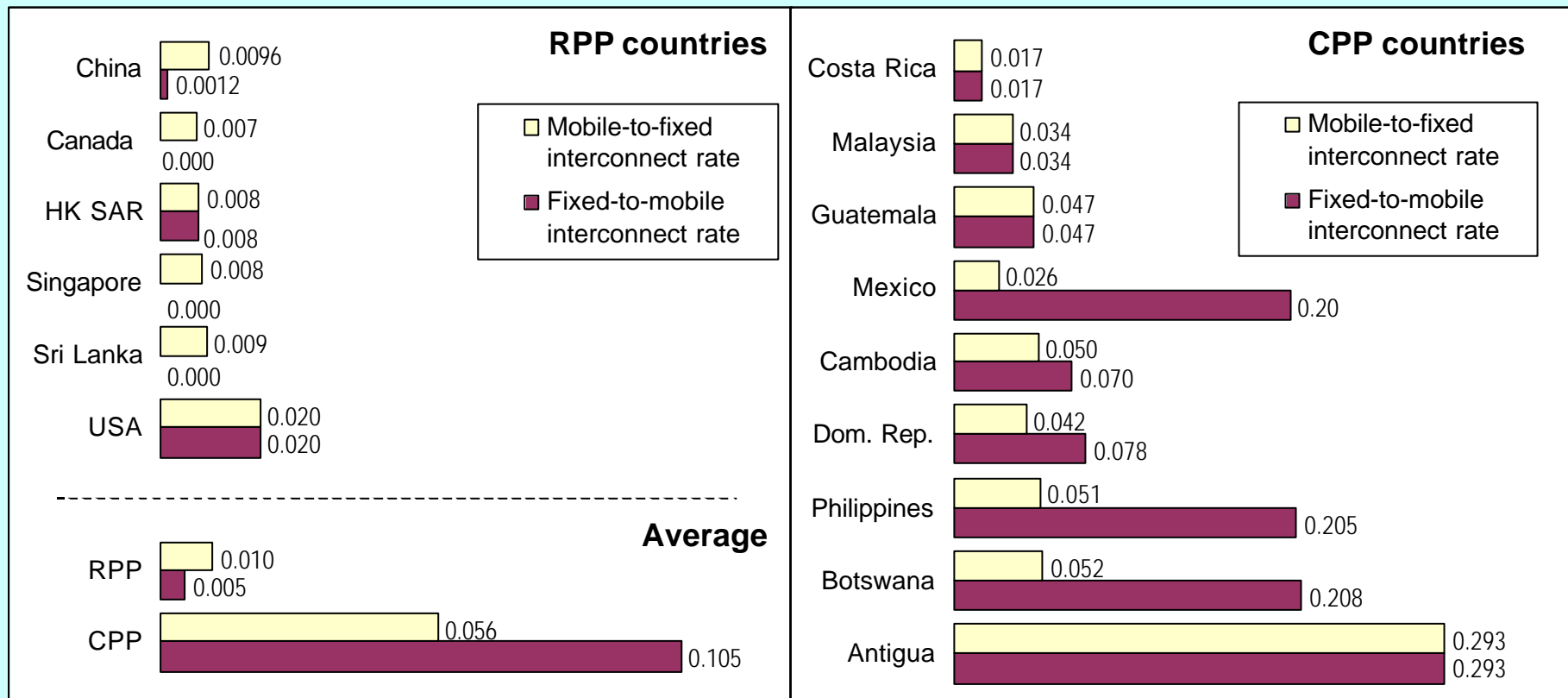
# Interconnection Rates in Selected European Countries

Calling Party Pays (CPP). In US \$ per minute.



# Interconnection rates in selected non-European countries

Calling Party Pays (CPP) vs. Receiving Party Pays (RPP). In US\$ per minute.





## TAL average interconnection charges

		<b>Mobile-Mobile Interconnection charge</b>	<b>Fixed-Mobile Interconnection charge</b>	<b>Mobile-Fixed Interconnection charge</b>	<b>Fixed-Fixed Interconnection charge</b>
<b>Average</b>	<b>2001</b>	<b>0.155</b>	<b>0.1418</b>	<b>0.0546</b>	<b>0.0269</b>
	<b>2002</b>	<b>0.1406</b>	<b>0.13505</b>	<b>0.0461</b>	<b>0.0252</b>

## TAF average interconnection charges

	<b>Fixed to Mobile Interconnect charge</b>	<b>Mobile to fixed Interconnect charge Local</b>	<b>Mobile to fixed Interconnect charge Single transit</b>	<b>Mobile to Fixed Interconnect charge Double transit</b>
<b>Average</b>	<b>0.167</b>	<b>0.078</b>	<b>0.096</b>	<b>0.150</b>

## ***Conclusion and Recommendation***

- **Erosion of traditional system of accounting rates for exchange of international traffic**
  - ⇒ **Domestic interconnect fees will be dominant mode**
- **Major price cuts in international calls**
  - ⇒ **Availability of new infrastructures**
  - ⇒ **Impact of Internet pricing model (distance and duration independent)**
- **Mobiles exceed fixed-line phones worldwide**
  - ⇒ **Introduction of “third generation” mobiles**
  - ⇒ **Generational shift, as new users reject fixed-lines**

**“ Interconnection and tariff rebalancing”**