

Impact of Internet on the telecommunication business model

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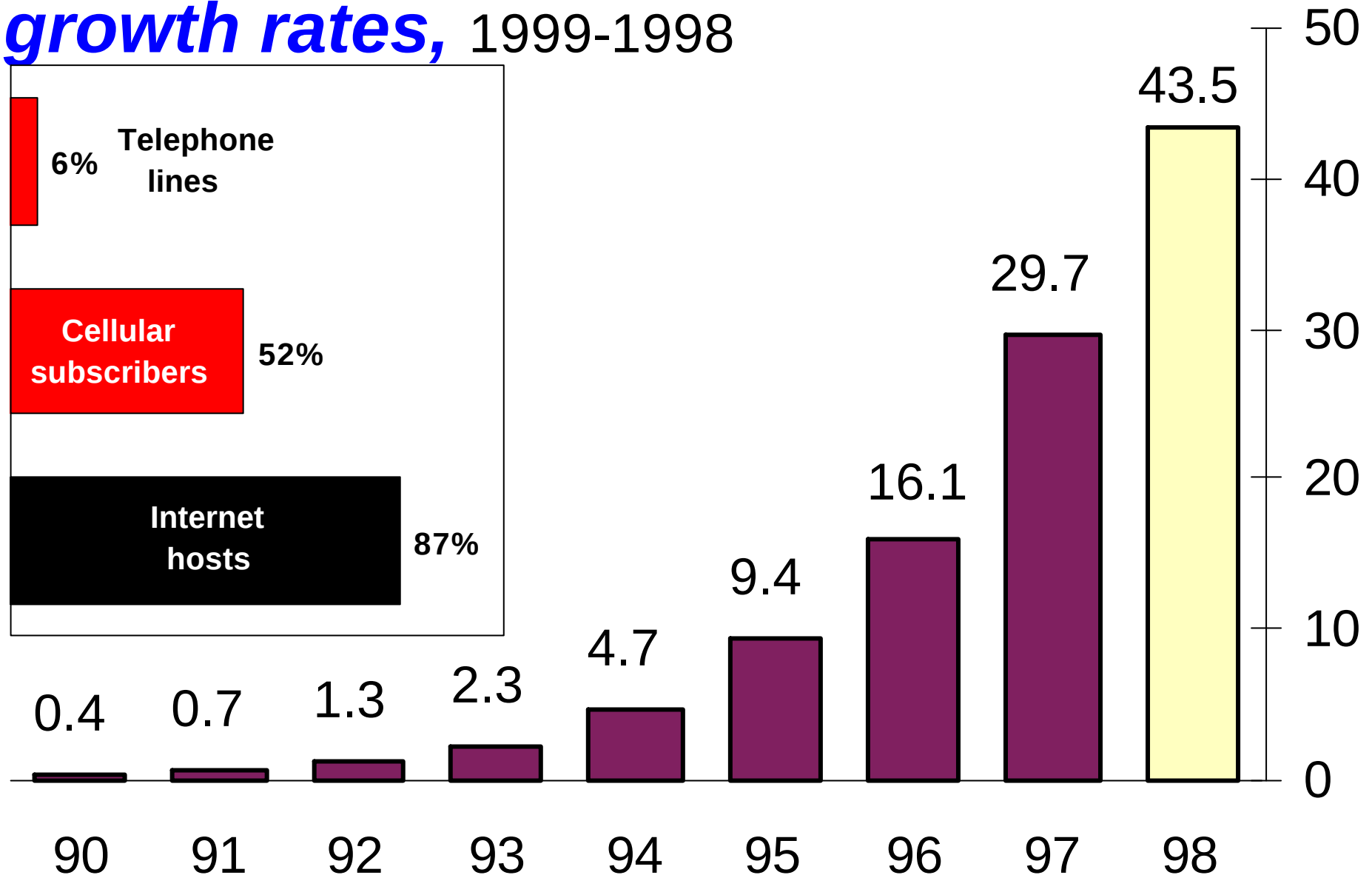
**If distance is dead,
and bandwidth is
infinite ...**

**What do we bill
for?**

Agenda

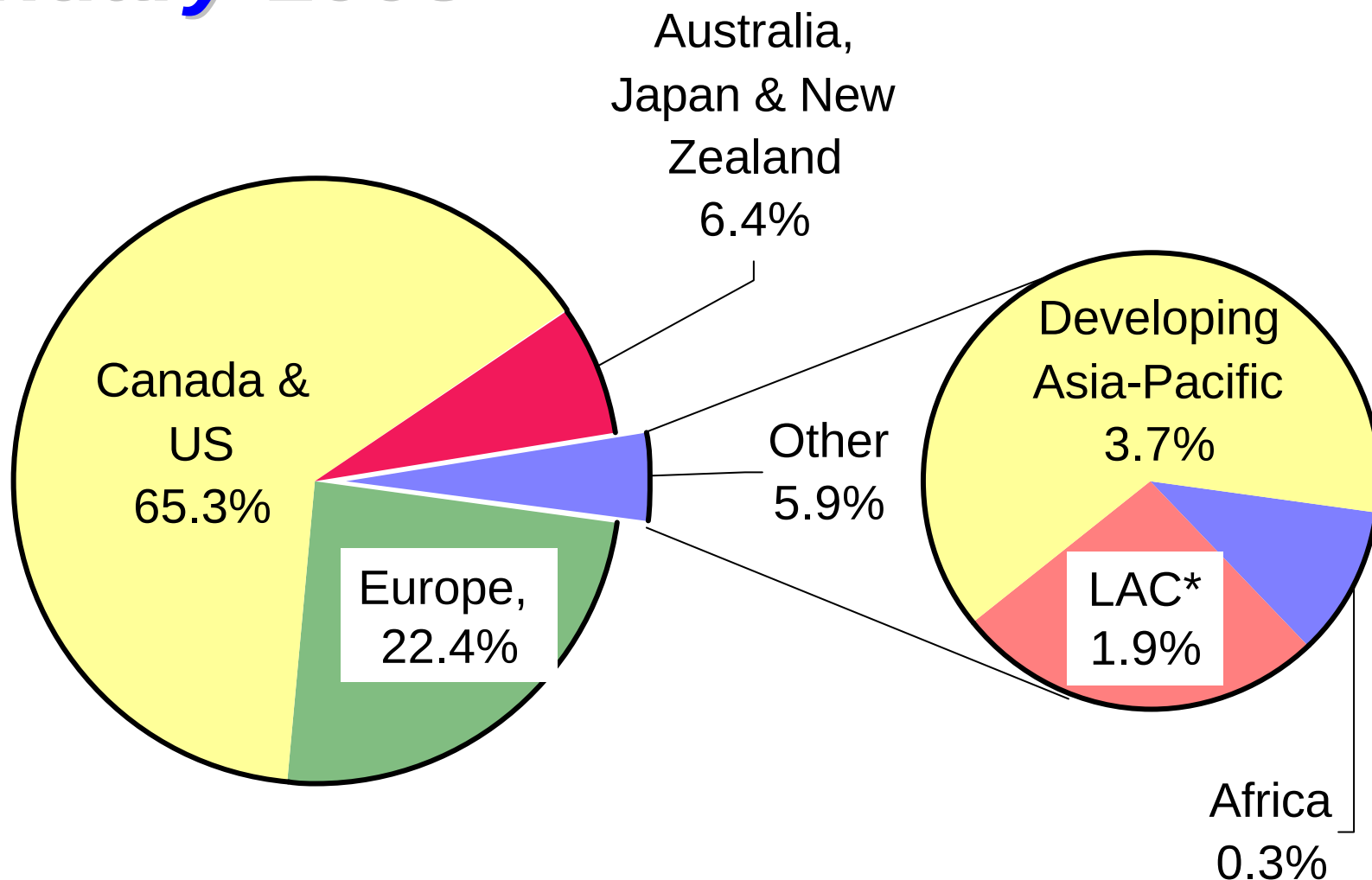
- The phenomenal growth of the Internet
- Internet economics
- Pricing the Internet: What makes it different?
 - ⇒ Retail pricing
 - ⇒ Pricing of local calls
 - ⇒ Wholesale pricing
- Vulnerability of telephone companies to competition from the Internet
- Future pricing and billing of IP services

Internet hosts (million) and comparative growth rates, 1999-1998



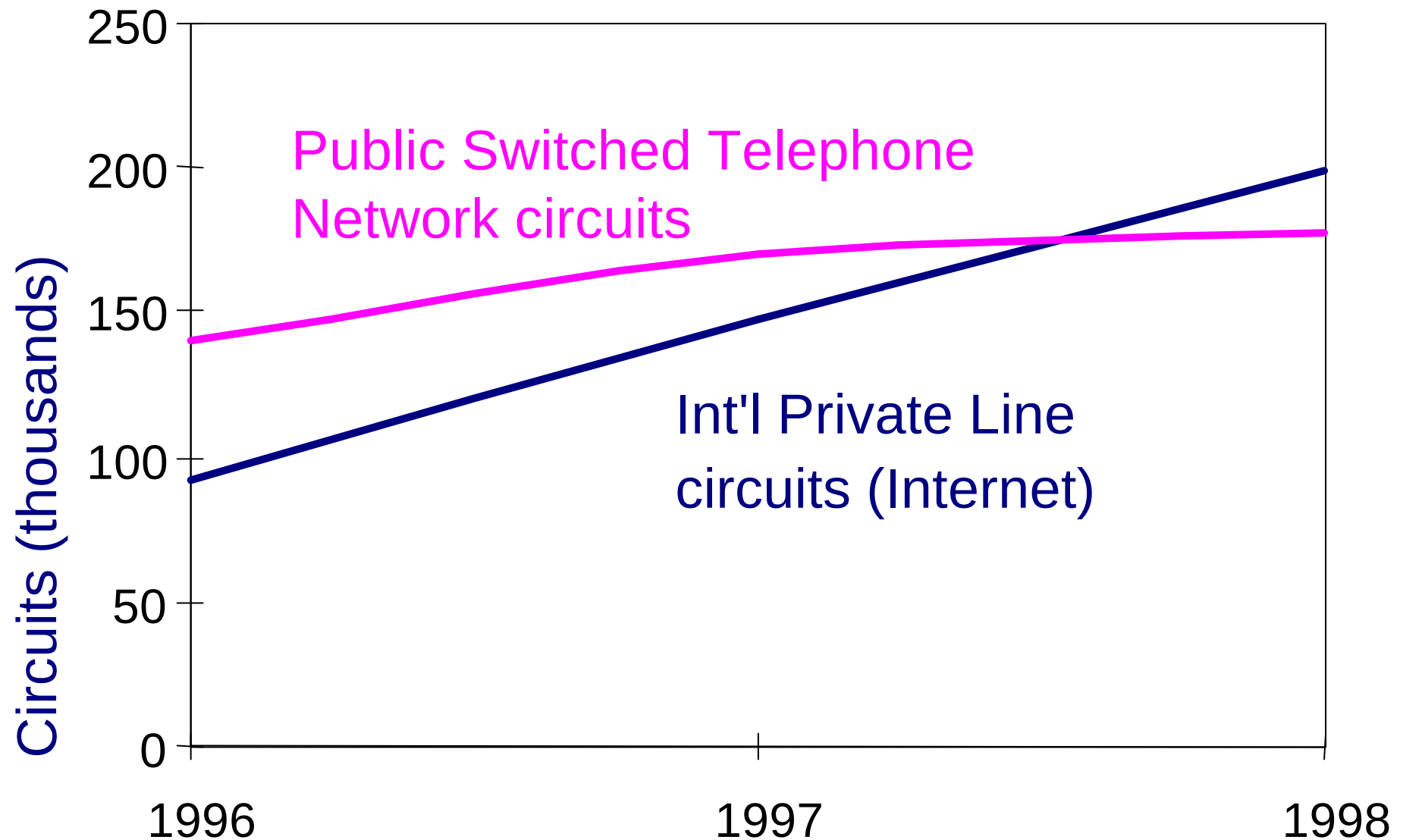
Source: ITU "Challenges to the Network: Internet for Development", Network Wizards.

Distribution of Internet hosts, January 1998



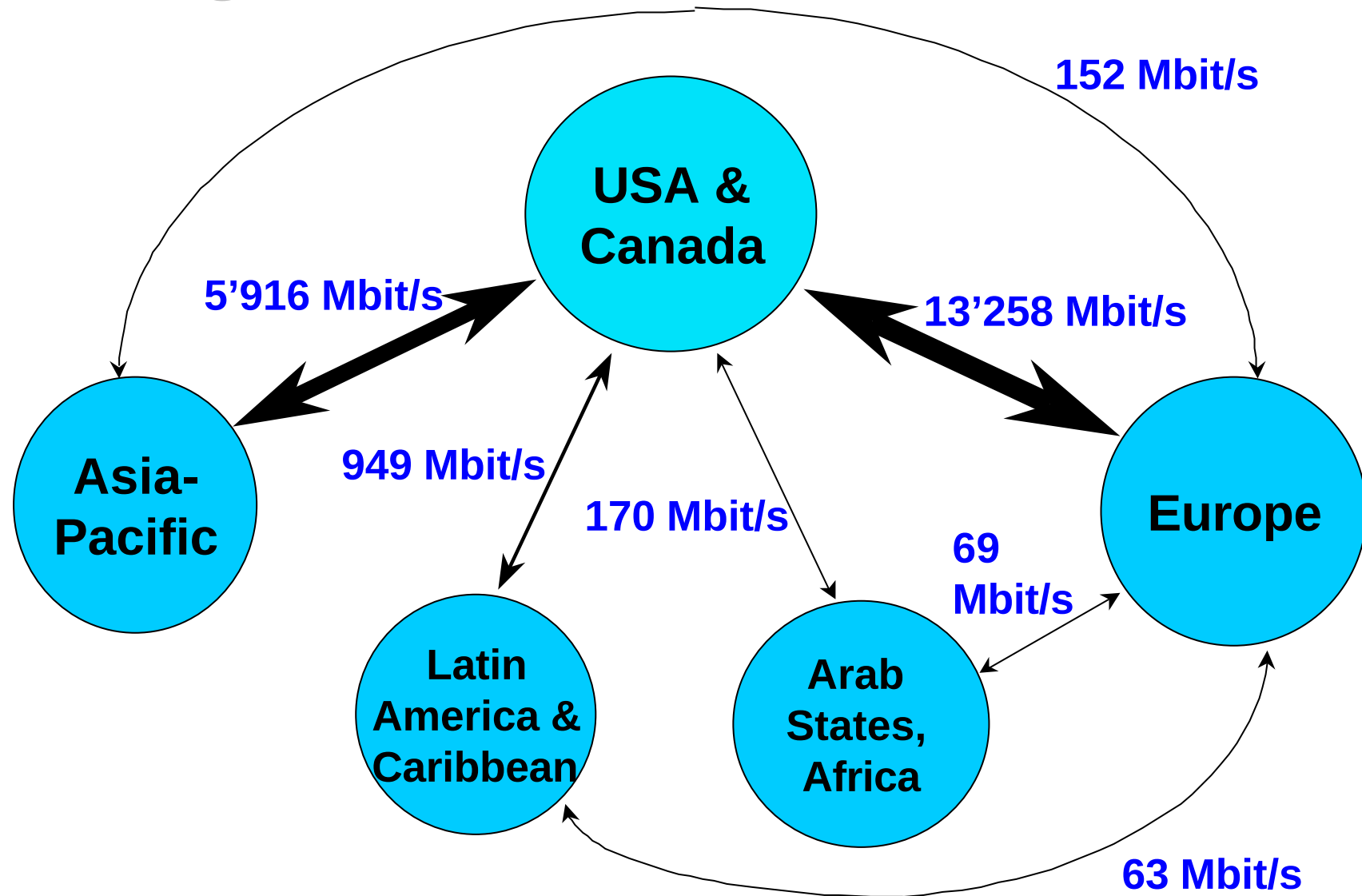
Source: ITU "Challenges to the Network: Internet for development, 1999".

Internet eclipsing the PSTN



Note: Based on usage of circuits between the US and the rest of the world. Source: FCC.

Inter-regional Internet backbone



Source: TeleGeography Inc., Global Backbone Database. Data valid for Sept. 1999.

Internet Economics: Five factors that make the Internet different

1. Packet-switched network architecture

⇒ **Connection-less not connection-oriented**

2. Pricing independent of distance & duration

⇒ **Average message covers 15 or more “hops”**

3. Peering arrangements, not settlements

⇒ **Based on a full-circuit regime, not on half-circuits**

4. Traffic flows highly asymmetric

⇒ **Dominant flow is to terminal that initiates a session (though this is changing)**

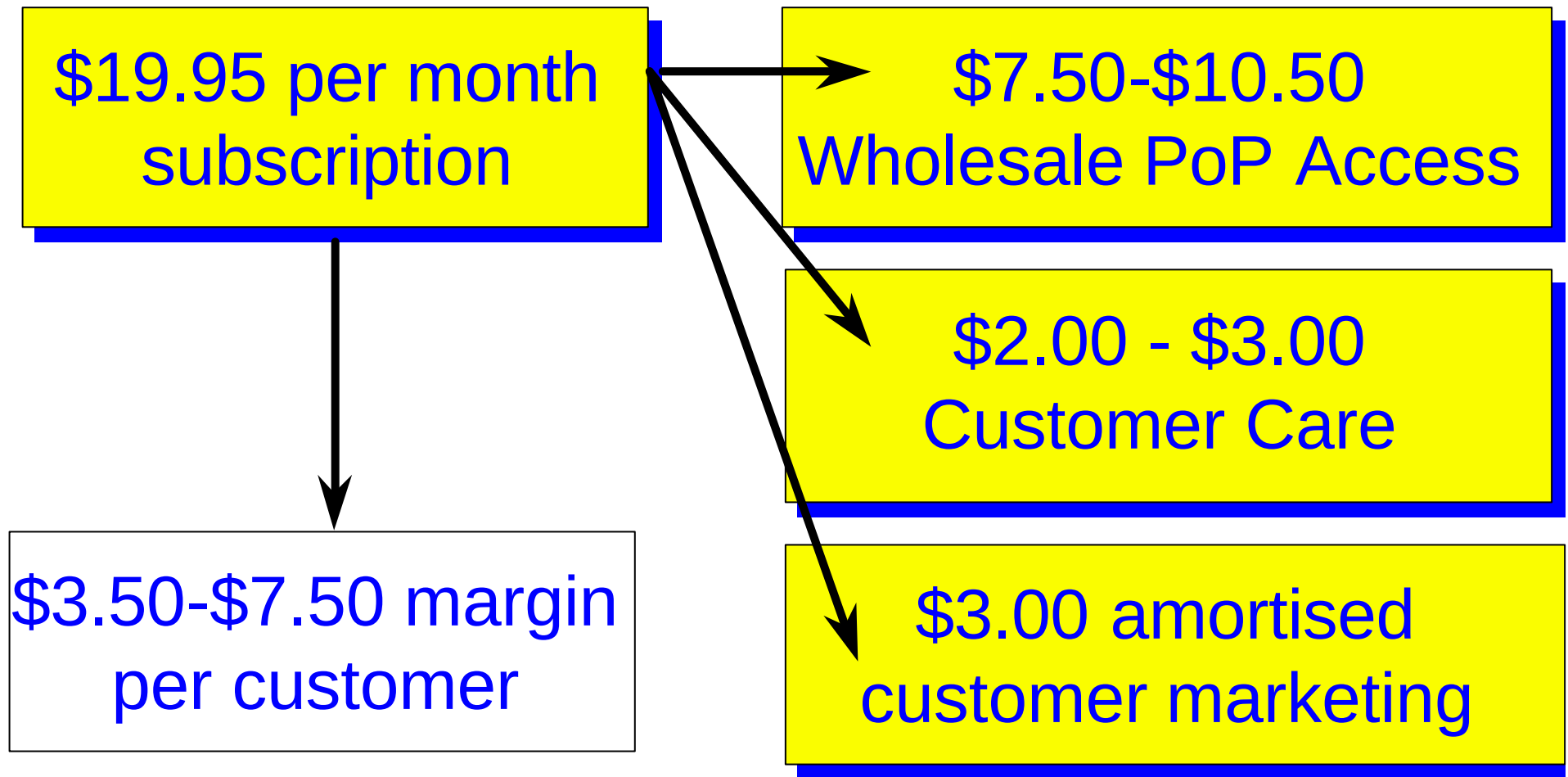
5. The United States sets the rules!

⇒ **There is no “Internet Telecommunication Union”**

Internet, price and service trends: Retail market

- **Towards a flat-rate price structure**
 - ⇒ **All you can eat for US\$19.95**
- **Towards lower service quality**
 - ⇒ **“Best efforts” service delivery at lowest price**
- **Death of distance**
 - ⇒ **Message to other side of earth costs same as a message sent next door**
- **Cross-promotion of Internet and other services**
 - ⇒ **“Free PC” with three year’s ISP subscription**
 - ⇒ **“Free Internet” with residential local loop charges**
- **Tendency towards industry concentration**
 - ⇒ **AOL’s subscriber base > next ten ISPs added together**

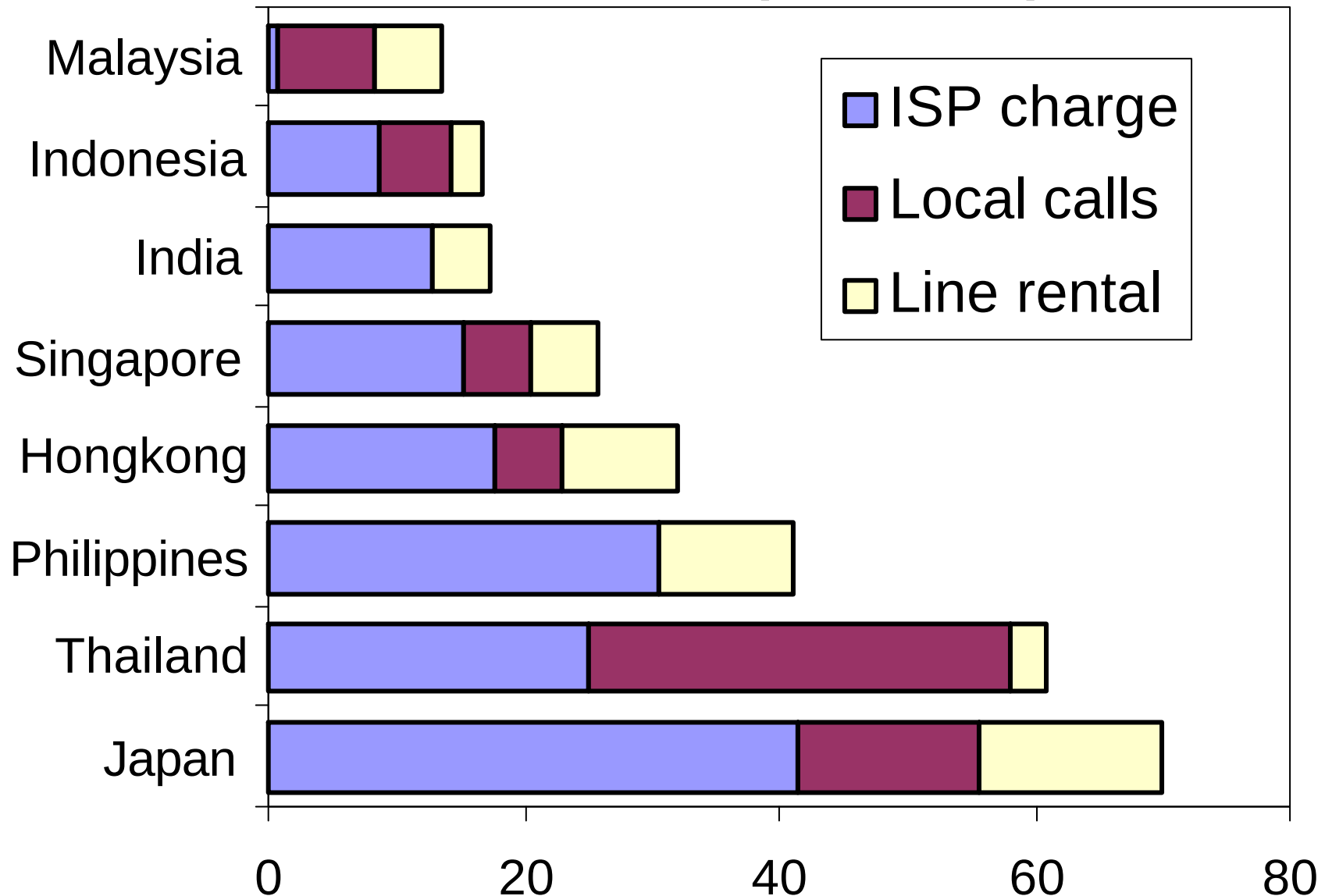
Where does the money go? Typical Internet Service Provider cash-flow



Source: Adapted from Paul Stapleton, ISP\$ Market Report, Boardwatch Magazine.

Asia-Pacific, comparative prices,

In US\$, based on 20 hours off-peak use per month



Source: ITU "Challenges to the Network: Internet for development, 1999".

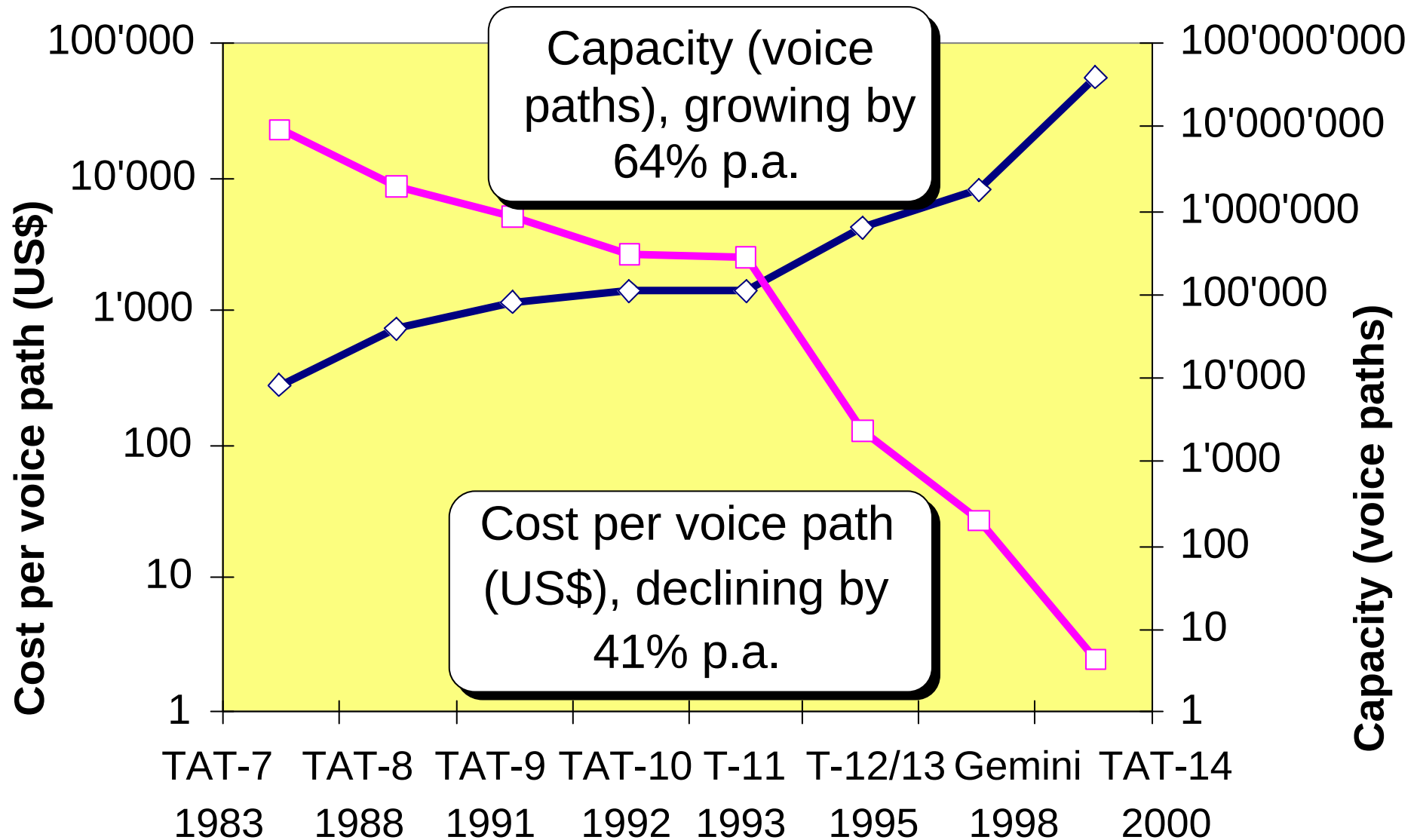
When is a local call not a local call?

- Internet usage has grown fastest in countries which permit “free” or untimed local calls (e.g., USA, Canada, HK, Australia)
- But, PTOs claim that Internet users and ISPs are “free-riding” the network
 - ⇒ longer average sessions
 - ⇒ asymmetric traffic flows
- In countries where local calls are metered, users complain that Internet is too expensive
 - ⇒ “Strikes” of Internet users in Germany, France
- Rapid take-off of “Free Internet”
 - ⇒ Free monthly Internet access in return for loyalty to dial-up local loop service provider

Internet, price and service trends: Wholesale market

- **Tendency towards industry concentration**
 - ⇒ **Top 3 backbone service providers control > 70% of the market (measured by ISP connections)**
- **Economics of industry driven by hubbing**
 - ⇒ **> 90% of Internet traffic still passes through USA**
- **Peering arrangements being replaced with capacity-based transit payments**
 - ⇒ **Economies of scale forces smaller ISPs to concentrate traffic or surrender independence**
- **Leased line prices are critical to price variations**
 - ⇒ **Full-circuit regime replaces half-circuit telephony regime**

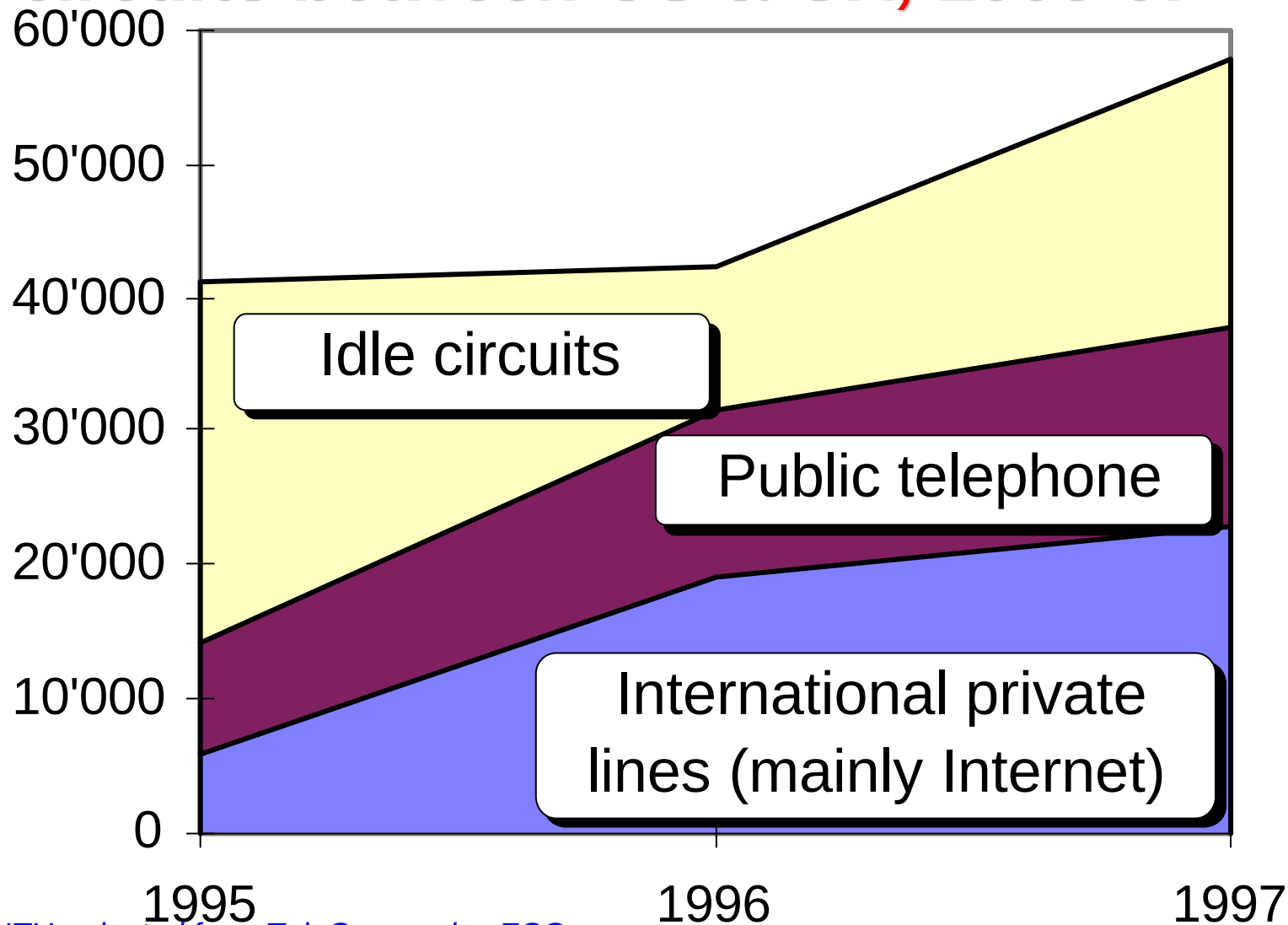
Infrastructure capacity and costs, TransAtlantic cables, 1983-2000



Source: ITU, TeleGeography Inc., FCC.

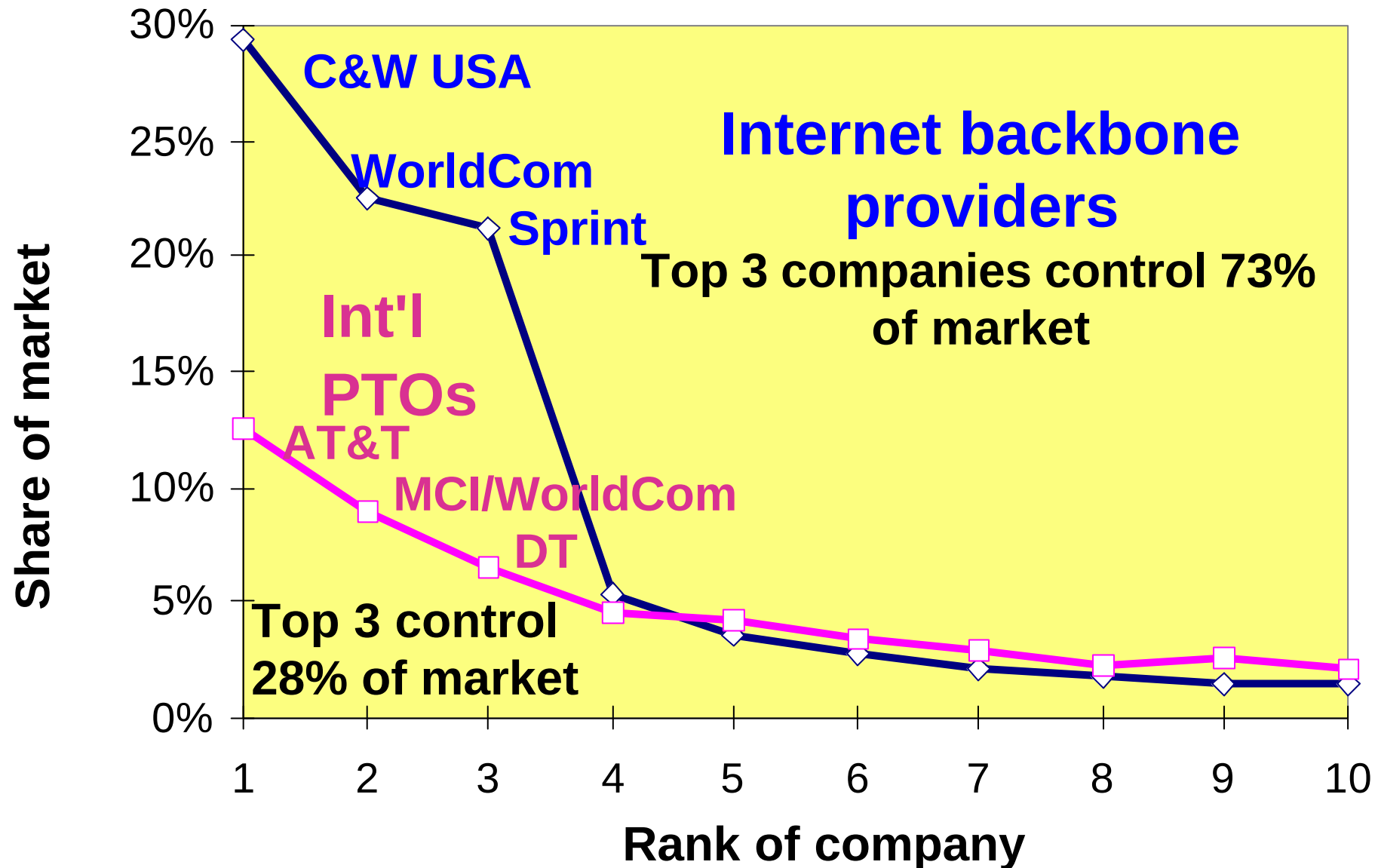
Note: Voice-path numbers assume a compression ratio of 5:1 to number of circuits.

Internet taking an increasing share of international network capacity. Usage of int'l circuits between US & UK, 1995-97

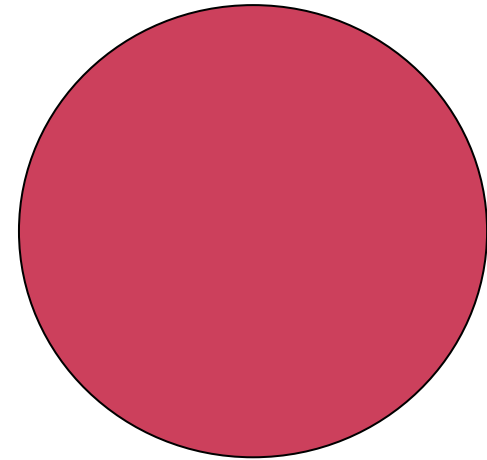
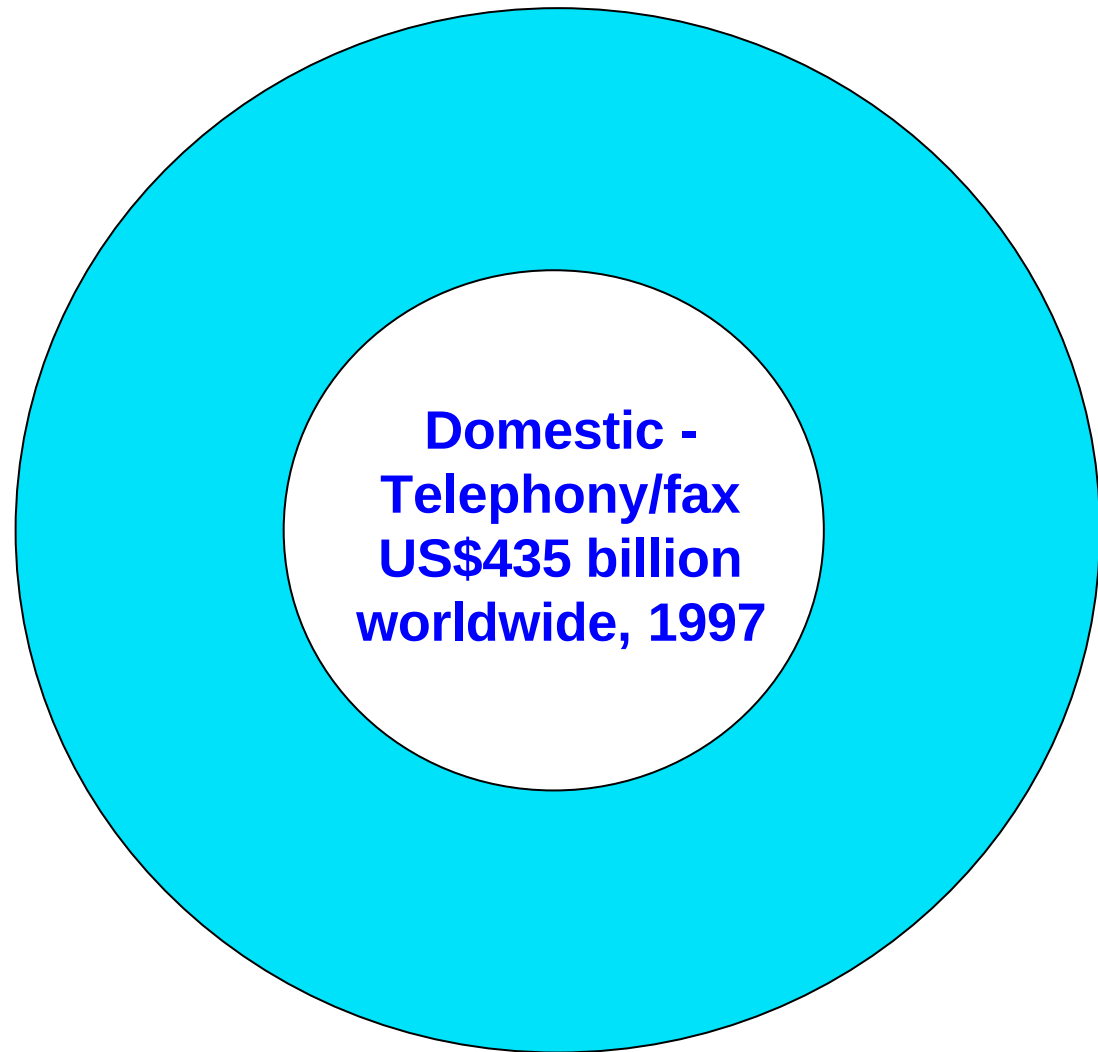


Source: ITU, adapted from TeleGeography, FCC.

But, Internet backbone market is more concentrated than int'l telephone traffic



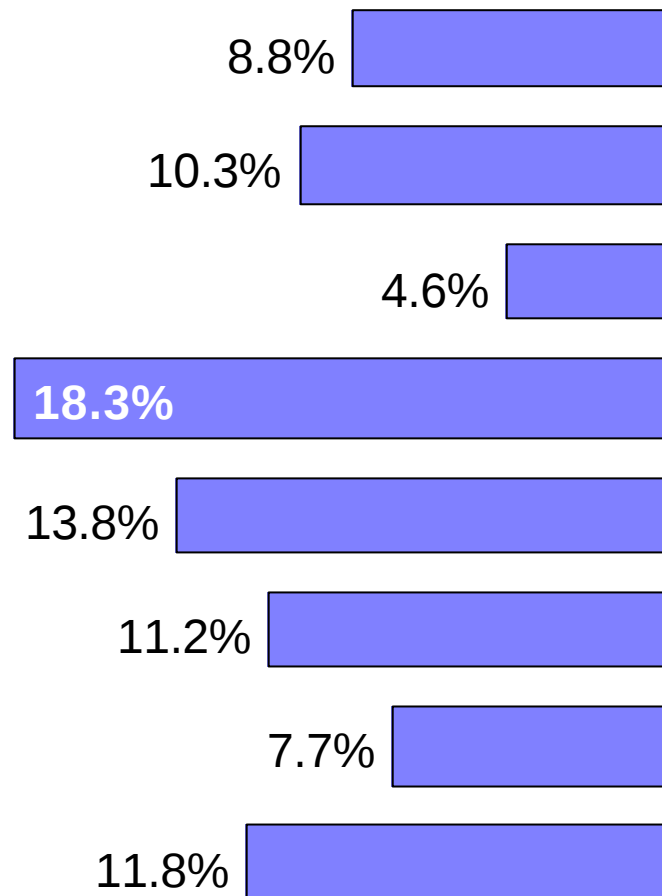
Sizing the market



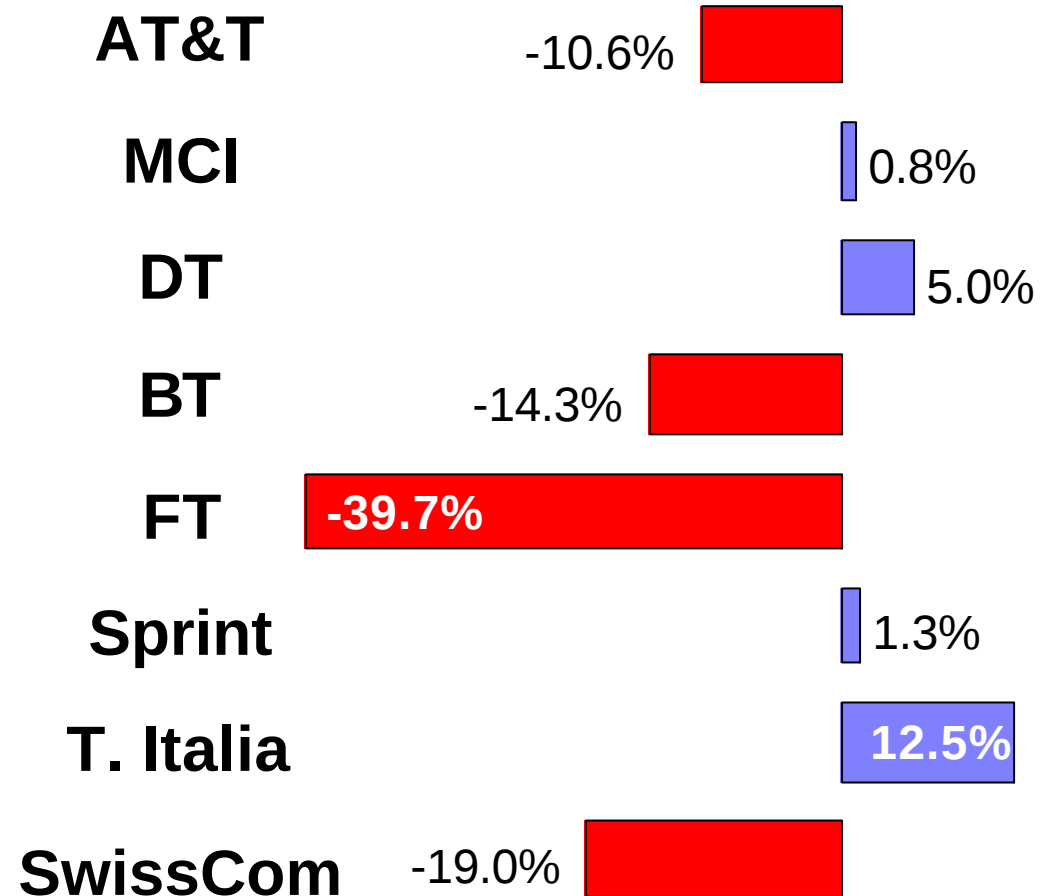
Source: ITU World Telecommunication Indicators Database, and ITU estimates

Top 8 international carriers, 1996/97

Growth in traffic



Change in int'l revenue



Source: ITU, TeleGeography Inc.

Note: Revenue change is based on dollar figures and may be different if expressed in local currency.

Assessing the risk to the Telcos

Where will they take a hit?

High risk

Moderate risk

Low risk



Fax traffic

International voice

**National and local
voice traffic**

**Data
communications**

**Mobile data
services**

Leased circuits

**Public Packet-
switched Data
Networks**

**Managed Data
Services**

**Mobile voice
services**

Proprietary e-mail

**Virtual Private
Networks**

**Public Switched
Network**

**Electronic news
services**

**Paging services
Freephone**

**Maintenance
Local loop**

If distance is dead and bandwidth is infinite, what do we bill for?

- **Bill for network connection**

- ⇒ Increasing integration of monthly telephone subscription and Internet subscription prices

- **Bill for privacy/advertising**

- ⇒ Privacy-protected customer pays premium

- ⇒ Customer agreeing to receive advertising pays less

- **Bill for quality of service**

- ⇒ Differentiated by transmission quality, waiting time, bandwidth on demand, value-added secretarial support, mail functions etc.,

- **Bill for Billing**

- ⇒ Customising of billing: by service, by user, by site