



**African Regional Seminar on Costs and Tariffs**  
**Bamako (Mali), 7-9 April, 2003**

**VoIP and regulatory policy issues for  
NRA's in developing countries**

**Mark Scanlan**

# Main regulatory issues with VoIP (1)

- VoIP is primarily an accounting rate by-pass service
- VoIP may undermine the ability of developing countries to earn net settlement revenues from abroad.
- The net effects are not obvious – take country *A* (developing), and *B* (the developed World)
  - a) Substitution effect: VoIP will substitute for outgoing PSTN calls (net result: loss of collection revenues minus saving in settlement rate payments) ... more hard currency.
    - i.e. Calls that would have been made over the PSTN
  - b) Price effect: Lower overall price faced by users per outgoing international call will mean ↑ outgoing calls, and more local calls to VoIP providers in *A*, and increased local call revenues.  
(Assumes that neither IP phones are being used, or are callers using computers)

## Main regulatory issues with VoIP (2)

- c) Stimulation effect will result in increased international incoming calls: from *B* into to *A*. The net effect will depend on:
- i. increased net settlements where foreign callers use the PSTN,
  - ii. to the extent that incoming calls from *B* are also IP (i.e. by-pass accounting rates), the stimulation effect carries few benefits for *A*'s operator.
- a) implies ↑ consumer surplus in *A* and a loss of collection revenues for *A*'s operator
  - b) implies ↑ consumer surplus in *A* and ↑ call externality benefits for *B*.
  - c) implies ↑ call externality benefits for *A*, and perhaps ↑ settlement in-payments.

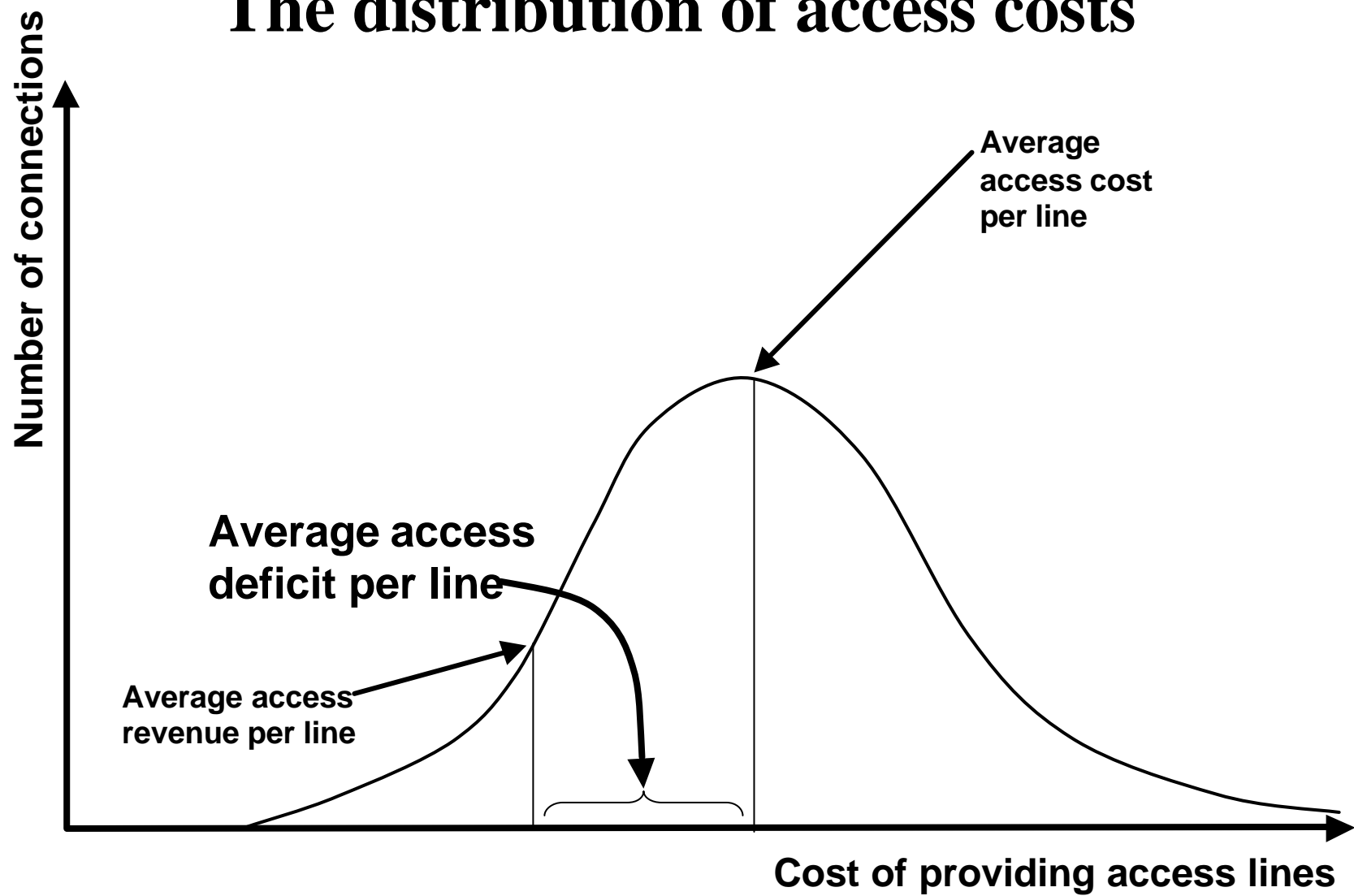
## Main regulatory issues with VoIP (3)

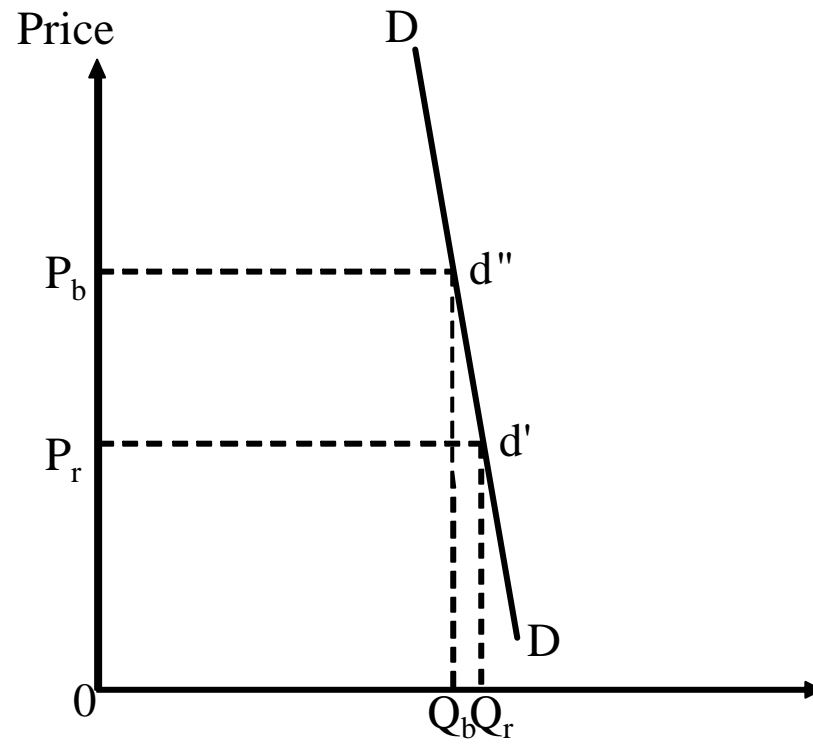
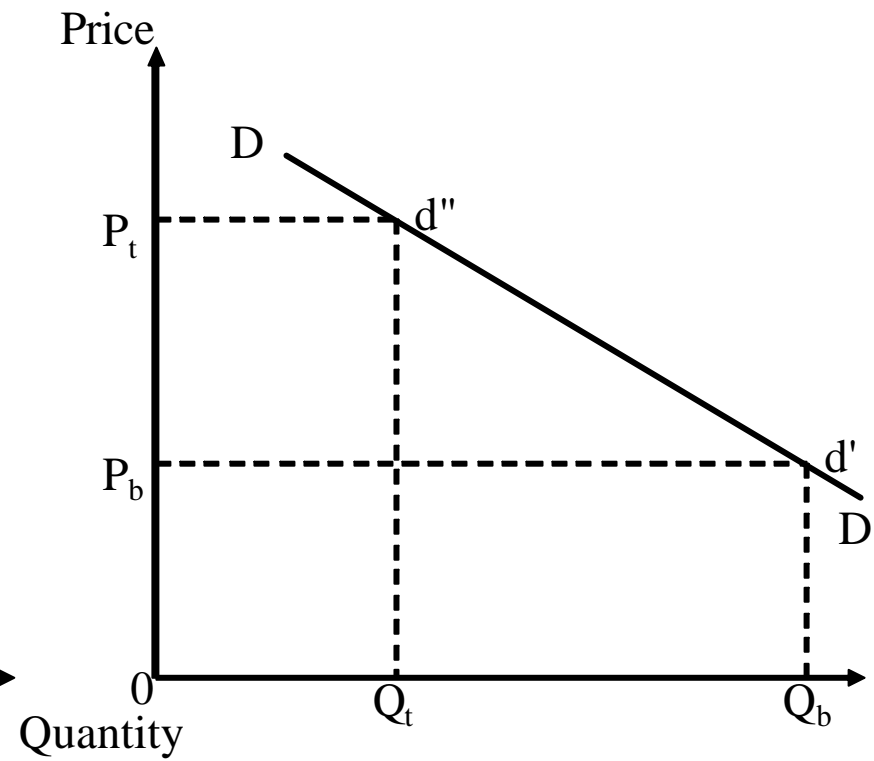
- For A's operator it is the strength of the 2 underlined effects that matter most
- Although we really need to model these effects together to predict the likely results, it seems likely that VoIP will further reduce net settlement income for A's operator – with what policy implications?
- Many developing countries have outlawed VoIP, i.e. they try to protect their settlement revenues. Why?

# Main regulatory issues with VoIP (4)

- Two contrasting explanations. Country A uses these revenues as:
  - 1) A means of funding /maintaining the network
    - Especially cross-subsidisation of the access network
  - 2) A source of tax revenues for cash starved states
- Protection of settlement revenues is correlated with a number of telecoms policy problems, including:
  - Access prices much less than cost i.e. an access deficit
  - Low household penetration rates, even given A's low GDP per capita
  - Long waiting lists
  - Lack of network development in rural areas
    - Many unserved villages
- What is an access deficit (AD)?

# The distribution of access costs

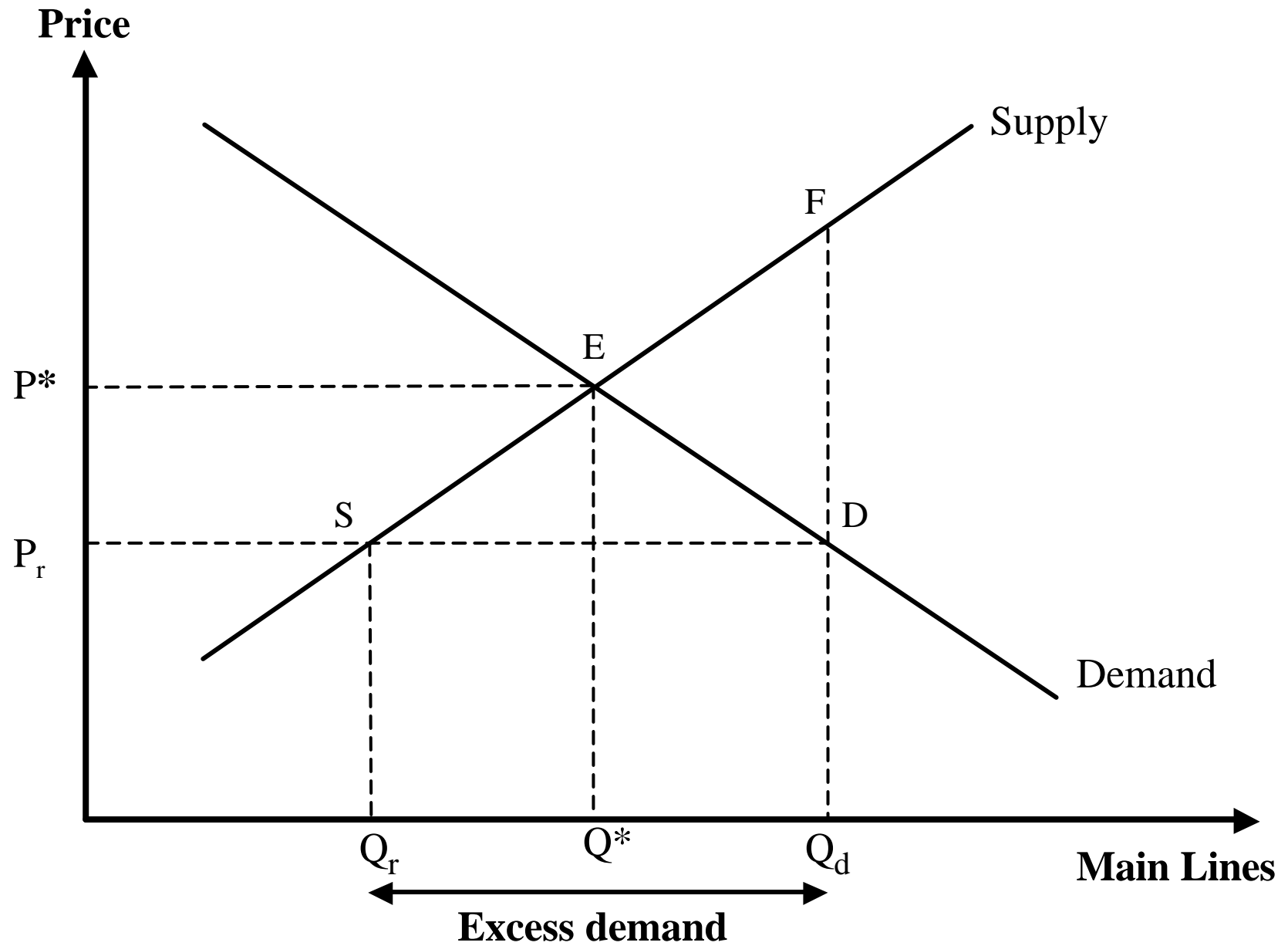


**Demand for Access****Demand for international calls**

## Correlated regulatory problems of VoIP by-pass (1)<sup>8</sup>

- An AD occurs when an operator's average access charges are not set high enough to cover the long-run average incremental cost (LRAIC) of providing an access service.
- ADs in developing countries are traditionally cross-subsidised with profits from international services.
- An operator need not be incurring losses because it has an AD as it will be earning other revenues per line
- 2 main Problems:
  - Lack of incentive to build out the network
  - If competition is permitted, A's incumbent high profit services, e.g. from international and long-distance calls, will be cherry picked
- Low penetration rates in developing countries are primarily due to supply-side not demand-side constraints.





Source: Ross and Banerjee 2000

## Correlated regulatory problems of VoIP by-pass (2)

- Empirical evidence from South and Central America is that higher residential subscription charges lead to higher penetration rates.
- AD policy causes the problems it is intended to cure.
  - It does not grow the network (price has little effect)
- It is also the cause of competition distortions due to cross-subsidies.
- Also evidence that competition lowers costs, improves management performance, and is associated with higher teledensity.
  - Rapid growth in subscriptions and rural network development followed rebalancing, liberalisation and privatisation.

## Correlated regulatory problems of VoIP by-pass (3)

- Regulatory and tariff reform can provide for improved network development.
- Countries should move away from the AD policy funded by net settlement in-payments
- Do not outlaw VoIP but look at the regulation that encourage it.
- While the ISP model tends to be competitive, there are potentially two main problem areas
  - 1) In some regions, there may be too little competition between transit providing ISPs such that end-user ISPs are being required to pay excessive prices for transit
    - Satellite access can limit this problem

## Correlated regulatory problems of VoIP by-pass (4)

- 2) Little competition between end-user ISPs, e.g. due to:
  - (i) Low levels of demand (ability to pay), such as can occur in developing economies.
  - (ii) Onerous licensing regimes which:
    - unnecessarily limit the numbers of competitors, or
    - charge too high fees, or imposes other costly obligations which discourage entry;
  - (iii) Other regulatory problems exist that make investing risky, the main one being poorly developed regulatory institutions, and
  - (iv) Because the incumbent operator is imposing excessive charges for granting ISPs access to its network (incl. leased lines), and/or is preventing access to its network.
  - (v) Inactive supply-side of the economy

# Non-jurisdictional IP regulatory issues (1)

- There are several non-jurisdictional IP regulatory issues to be aware of:
  - The replacement of IPv4 by IPv6 which will likely be necessary in the next 4 to 7 years.
    - Some countries are requiring ISPs to switch to IPv6 by a certain date
    - Others, such as the EU, are pushing for an early switch to IPv6 by injecting large amounts of public funds.
  - This is an issue the Internet Community is keeping a close eye on.
    - It is doubtful whether any administration needs to do more than observe developments at this stage.

## Non-jurisdictional IP regulatory issues (2)

- Access to names numbers and addresses has attracted regulatory interest due to the need for networks that are based on different addressing schemes to interoperate.
  - The main example is the need for VoIP providers and PSTN networks to be able to have calls terminated on the other network. The policy issues focus on the **ENUM** debate.
  - As this is not a country specific regulatory issue – no need for NRAs to do anything proactive.
- **Standardisation** (or the lack of it) in the Internet is another area of interest to regulating authorities,
  - Both hardware and software incompatibility is a problem issue, which also concerns technological development.

# PSTN relation regulatory issues concerning VoIP

15

- If / when VoIP becomes a close substitute for switched circuit networks, we may need to rethink PSTN interconnection price structures
- For price capping, we need to forecast the convergence rate of the Internet with the PSTN –
  - likely to involve considerable error compared to the pace of actual convergence
- May also need to review the structure and units of retail PSTN prices
  - usage outside of peak periods is almost costless but prices are not.
- Levying special taxes, e.g. universal service contributions:
  - Clearly where these taxes are significant and levied on PSTN operators and not on VoIP providers, a competitive non-neutrality can arise.

# Conclusions

- VoIP is an accounting rate by-pass service
- It has the potential to undermine the system of cross-subsidies used to fund networks
- Theory and evidence suggest that the policy of cross-subsidising access networks causes network underdevelopment.
- ISPs model is generally competitive – look at your own regulations and institutions if it is not.
- If / when VoIP takes off, we will need to rethink PSTN regulation