# NGN Interconnection: pricing strategies and regulatory approaches to price regulation

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# Today's interconnection world

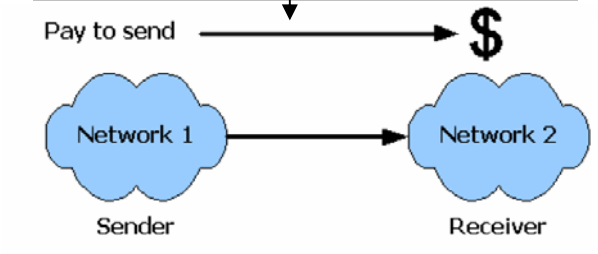
✓ Today two general interconnection regimes are established for voice and data regarding to their specific business models and traffic types.

| Voice | Data |
| --- | --- |
| **Charging model:** Calling Party's Network Pays (CPNP) as preferred interconnection regime<br><br>In some cases Receiving Party Network Pays (RPNP) regime might be found (e.g. 800-number calls)<br><br>**Revenue streams:** mostly generated by the call initiating subscriber paying all carriers for the transport capacities used.<br><br>**Traffic type:** symmetric | **Charging model:** Bill and Keep (BAK) as the preferred interconnection regime in the Internet<br><br>**Revenue streams:** mainly generated by subscriber access flat rates and advertisements, exchange of traffic among peers without settlement, when the traffic is balanced in each direction. If traffic is imbalanced, the Receiving Network Party Pays (RPNP).<br><br>**Traffic type:** asymmetric |

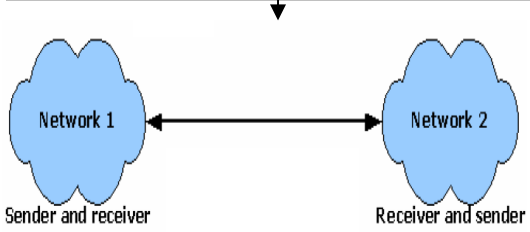
# Today's interconnection world

## Wholesale arrangements

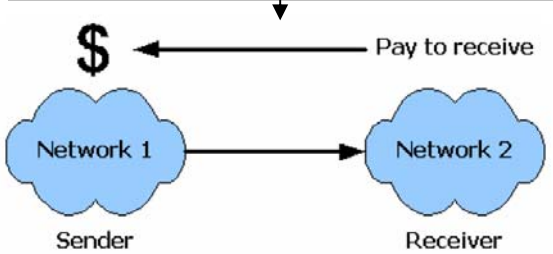
**Calling Party's Network Pays (CPNP)**




**No interconnection charge (Bill and Keep, BAK)**




**Receiving Party's Network Pays (CPNP)**




## Retail arrangements

**Calling Party Pays (CPP):** the recipient pays nothing

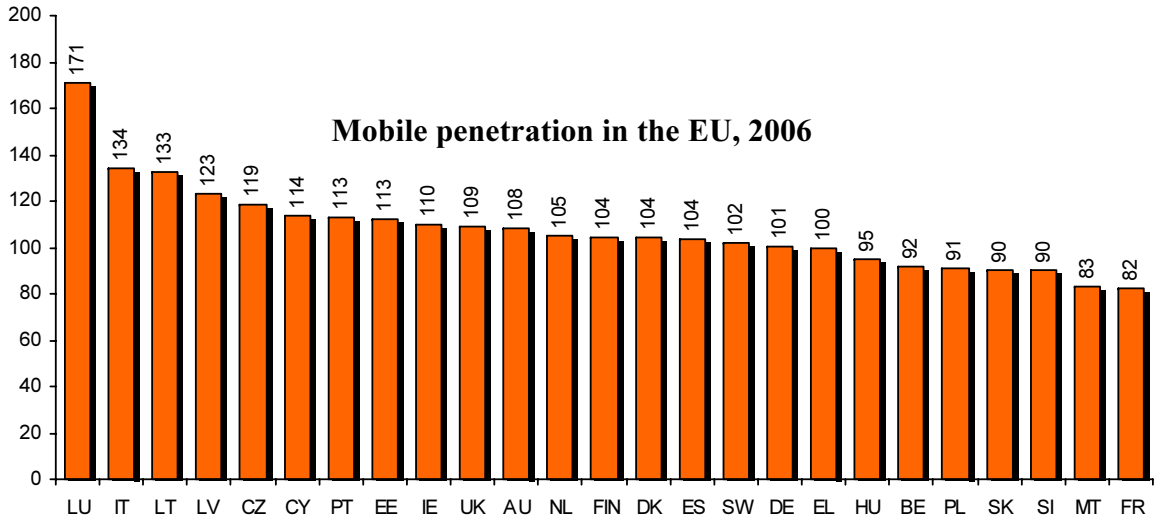
**Flat rate:** prevalent in BAK countries, and Internet

**Receiving Party Pays (RPP):** rarely used

*Source: Gilbert, Tobin*

# Today's interconnection world

- Charges at the wholesale level interact with retail pricing arrangements
  - Interconnection fee usually is a floor on retail price
  - High termination fees prevent flat rate plans from emerging
- CPNP (most common for voice telephony) with high terminations rates tends to lead to :
  - Subsidies for adoption, rapid penetration (e.g. case of mobile markets)
  - Higher retail prices
  - No flat rate plans for calls
  - Lower usage
- In the literature CPNP usually is considered as leading to higher penetration than BAK (e.g. mobile case)




- BAK can achieve quite high level of penetration
  - Singapore: 98%

*Source: EC, 2007*

# Regulation of interconnection

Role of regulators:

- Not regulate retail arrangements except to the extent necessary to address market power distortions
- The implications of wholesale regulation for retail behaviour are entirely relevant to the regulator

3 main reasons to regulate at wholesale level:

- Promote interconnection
  - Broader networks are more valuable, because of…
    - expanded connectivity - more options for calling (direct impact)
    - more complementary goods – more choice (indirect impact)
    - Scale and scope economies - lower costs (indirect impact)
- Control market power
  - Promote competition - entry facilitation
  - Protect consumers from market power abuse - price regulation
- Coordinate interoperability

# Regulation of interconnection

- Historical conditions has determined, that regulators have mainly focused on the control of market power:
  - Monopolies in fixed telephony;
  - Limited number of market players in mobile telephony

## Modes of abuse

- Denial of access: foreclose competition
- Discriminatory access: inferior access to 3rd parties relative to affiliated subsidiary
- Monopoly pricing: price access significantly above cost

## Regulatory response

*Common Principle - non-discriminatory access and interconnection obligation*

- Mandatory unbundling and interconnection
- Business restrictions (preclude retail entry)
- Regulated prices and terms of interconnection

# Approaches to price regulation

| | RoR | Price-cap | Cost orientation |
|---|---|---|---|
| **Prevent exercise of market power** | **Yes.** The regulated firm can only earn a normal rate of return. | **Yes.** The CPI-X constraint prevents the firm from exercising market power (if chosen with care). | **Yes.** Cost + Reasonable rate of return only. |
| **Productive efficiency** | **No.** The firm will not reap the benefit from reducing costs and so has no incentive to do so. | **Yes.** Firms are automatically rewarded with higher earnings when they reduce costs (penalized when costs increase). | **No.** In the case of HCA.<br>**Yes.** In the case of Forward-looking CA. |
| **Allocative efficiency** | **No.** Prices for individual services need not equal the costs of the service. | **Yes.** Firms have flexibility to set prices for individual services based on forward-looking costs.<br>It is possible for individual prices to deviate from costs | **Yes.** Prices for individual services equal the costs of the service.<br>No possibilities to deviate from costs. |
| **Dynamic efficiency** | **No.** No incentive to invest and introduce new technology or services | **Yes.** The firm has incentives to invest efficiently. | **Yes.** The firm has incentives to invest efficiently. |
| **Promote competition** | **No.** Does not generally permit pricing flexibility for the firm to set prices to reflect forward-looking costs in response to competition. | **Yes.** Baskets prevents cross-subsidization. The firm has sufficient pricing flexibility to respond to competitive pressures by setting prices that reflect underlying costs and demand conditions | **Yes.** The firm has to set prices that reflect underlying costs. No cross-subsidization. |
| **Minimize regulatory costs** | **No.** Rate proceedings are often lengthy and resource intensive. | **Yes.** Price cap proceedings are are infrequent (once every 3 to 5 years). | **No.** Control proceedings are lengthy and resource intensive. |

# Approaches to price regulation

**Regulators might use other approaches as well, such as…**

- **Benchmark –** But the outcomes of such regulations heavily depends on adjustments made. Without appropriate adjustments, benchmarking can result in interconnection rates that make little sense. The goal of the adjustments is basically to try to model interconnection costs without having enough detailed information on local cost inputs to carry out a full forward-looking cost analysis.

- **Retail minus -** But the outcomes of this approach depends on the level of retail prices. This approach is usually used in the case of sufficient competition in the downstream market.

**From the whole range of possible approaches to price regulation, the majority of EU states have chosen to adopt Cost orientation approach (generally, *FDC* or *LRAIC*) to regulate interconnection prices. Possible reasons:**

- The EU Commission recommendation;
- Possibility significantly to decrease interconnection prices in a relatively short time (when using HCA);
- Concerns about Price cap outcomes: X factor depends on operator's and the economy's *Total factor productivities,* CPI – on macroeconomic conditions; little regulatory impact, might take same time to get desirable outcomes…

# Approaches to price regulation

## Principles for calculating interconnection charges in the EU

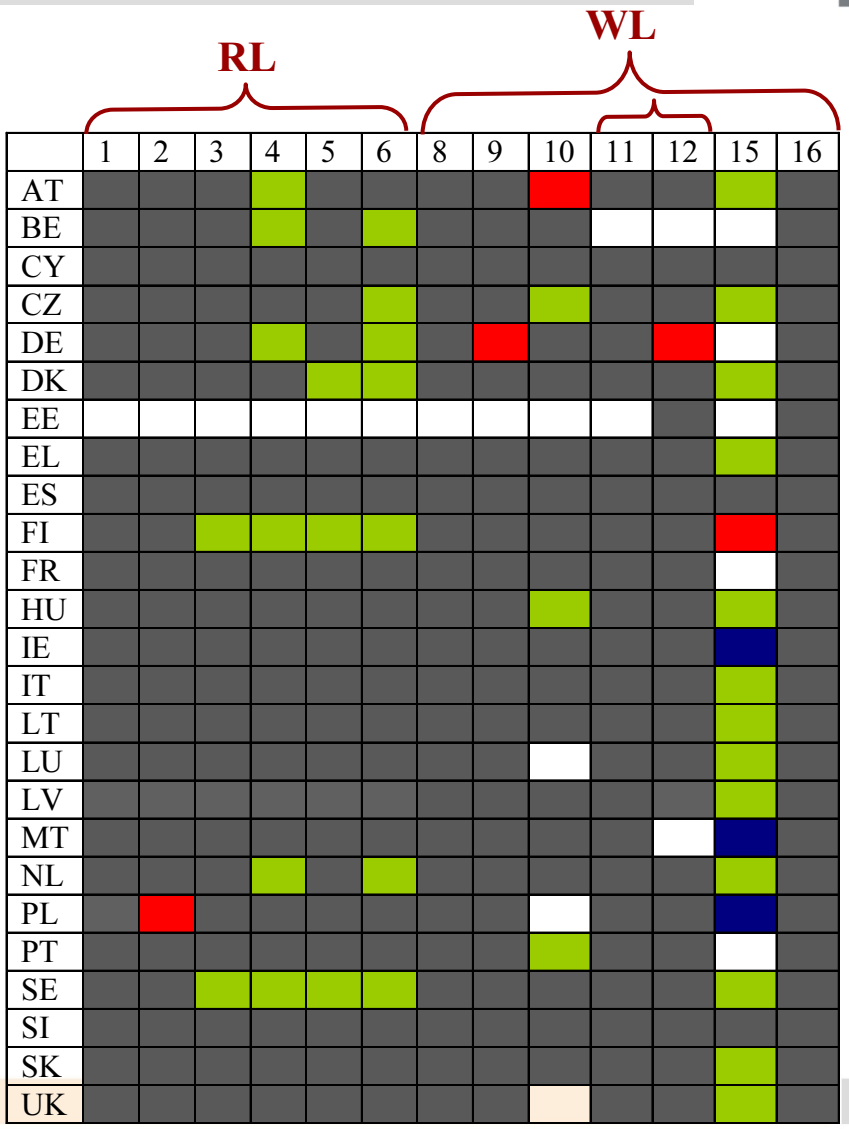
- The EU member states have adopted quite different methods (combination of cost base and cost standard) for their cost calculations;
- Although every country has taken its own approach, it follows from the table that most countries use a version of either FDC or LRAIC;
- Like the rest of EU, Lithuania has also adopted Cost orientation (LRAIC) approach to regulate interconnection prices…

| Country | Cost base | Cost standart |
|---|---|---|
| Belgium | Historic/Current | FDC |
| Denmark | Forward-looking costs | LRAIC |
| Germany | Forward-looking costs | LRAIC |
| Greece | Current | LRAIC |
| Spain | | Capacity-based model |
| France | Current | LRIC+mark-up for common costs+specific costs |
| Ireland | LRAIC | LRAIC |
| Luxembourg | Historic | FDC |
| Austria | Current | FDC |
| Portugal | Historic, forward-looking and current | FDC |
| Finland | Historic/Current | Company specifics |
| Italy | Forward-looking | LRAIC |
| Sweden | | LRAIC hybrid model |
| Netherlands | Current | EDC – for originating access tariffs, BU-LRIC – for terminating access tariffs |
| Czech Republic | Forward-looking | LRAIC |
| Cyprus | Current, Forward-looking | FDC – for retail services, LRAIC – for wholesale services |
| **Lithuania** | **Current** | **LRAIC** |

*Sources : EC, Center for Tele-Information, CMT*

# Consequences of price regulation

…and like the rest of EU, is still facing the absence of competition at both wholesale (WL) and retail level (RL)…




Competitive markets

Non-competitive markets

Joint dominance

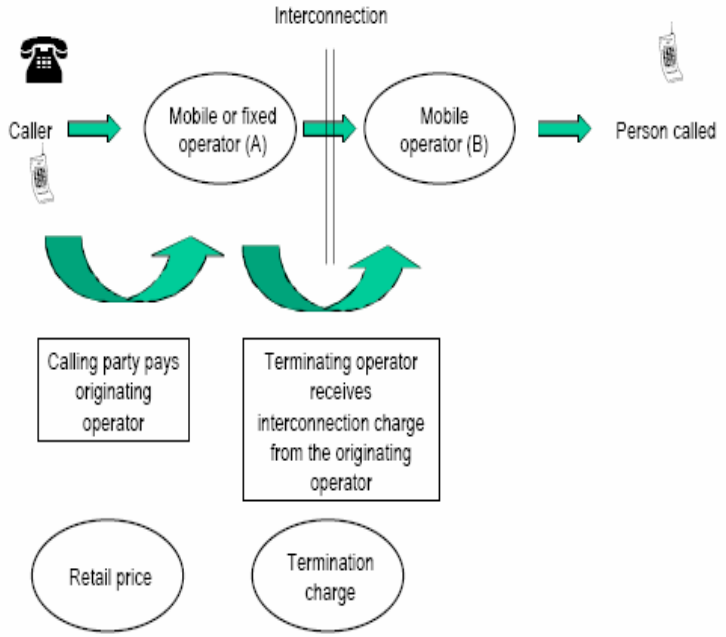
Market analysis results across the EU

# Consequences of price regulation

- **Current regulation of interconnect based around two principles:**
  - Any-to-any interconnect for established end-to-end services (like voice telephony)
  - Calling party pays

- **Together these principles lead to terminating monopoly problem:**
  - Only one path to terminate - terminating network is the only route to the called party
  - Subscribers care more about what they pay than what those who call them pay
  - Terminating operator has monopoly power
  - Incentive for terminating network to set high fees
  - The impact that above-cost termination fees have on retail prices
  - Incentives to collude? (mobile roaming)

Figure 1: The CPP (calling party pays) model




*Source: O. Bomsel, M. Cave, G. Le Blanc, K. Neumann*

# Consequences of price regulation

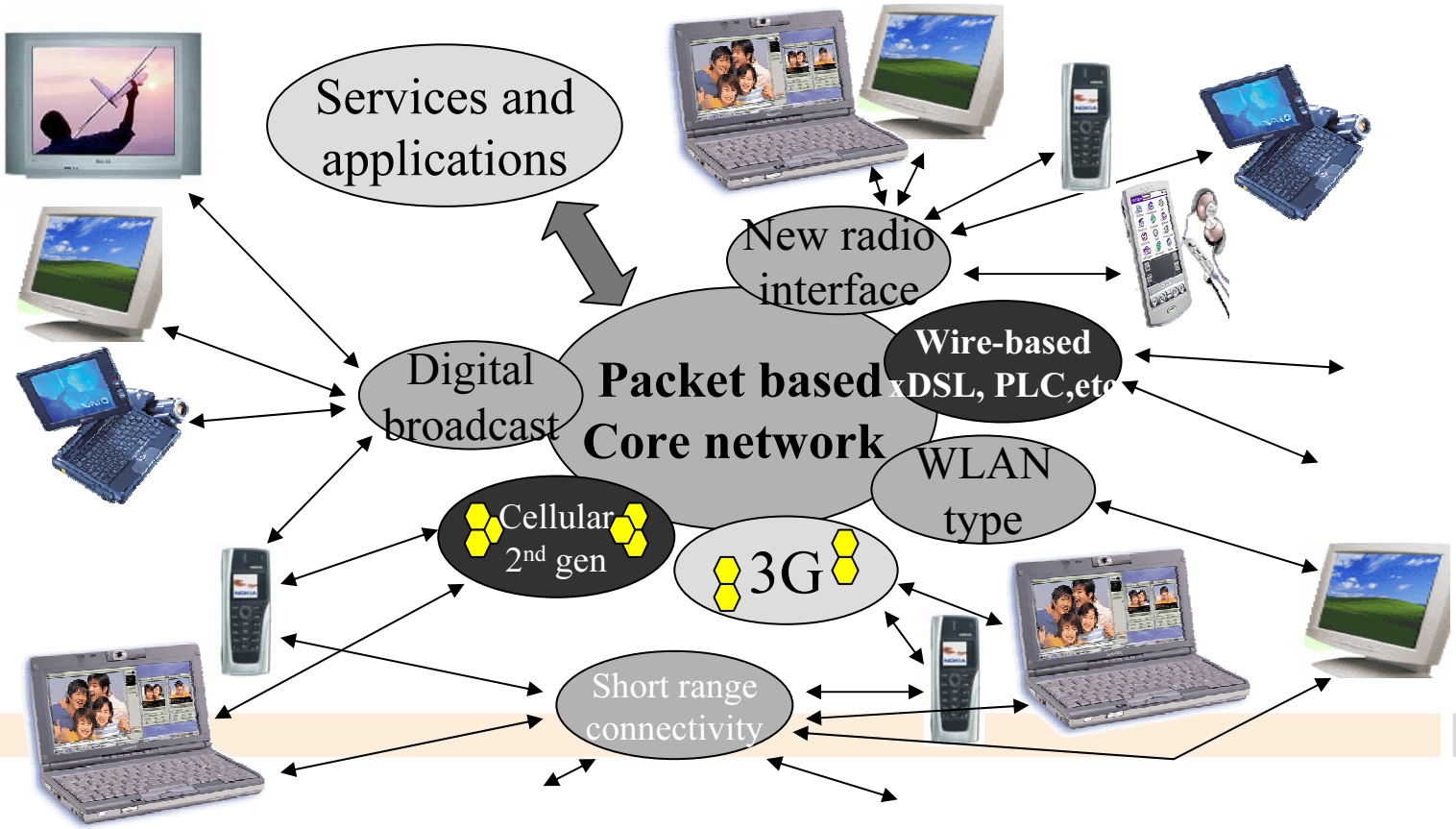
✓ A provider with significant market power in the fixed markets is subject to general retail regulation, whereas there is currently no retail regulation in the mobile markets. In the wholesale markets, almost all network operators have been found to have significant market power for termination of calls on their own networks.

➢**Together these principles lead to possible problems in originating markets… :**

- Are those markets really competitive? Bearing in mind:
  - Switching costs
  - "Friends & Family" tariffs: discriminate between on-net and off-net calls
    - Mobile penetration in Lithuania is 135 %, is this really the pure outcome of effective competition in the retail mobile market?

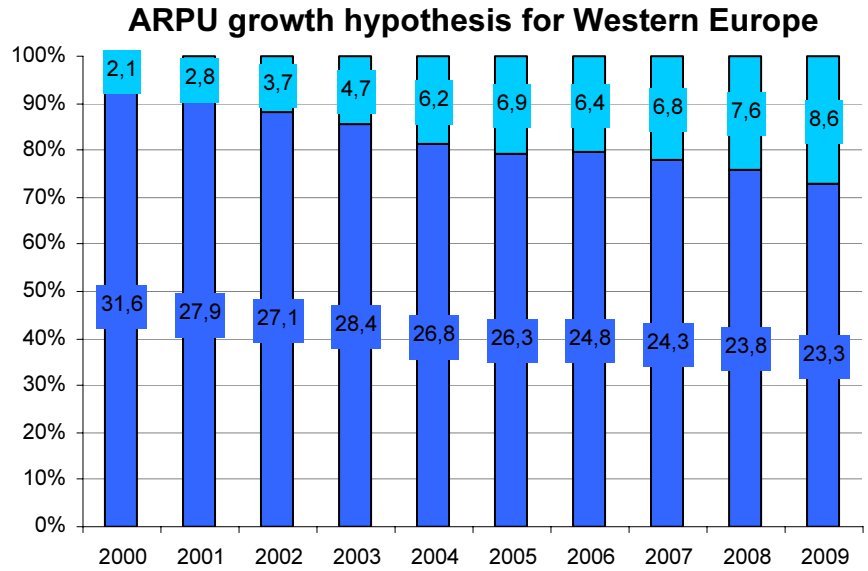
# Implications for future regulation

- The regulatory experience shows, that it is not easy to cope with Telecom interconnection issues…
- Today convergence and technological development leads to the "network of networks"
  - Traffic passes between networks owned/operated by different carriers, or across regulatory boundaries.



# Implications for future regulation

- The migration to IP networks breaks the historical linkage between the service and the network, enabling to emerge of independent service providers
- The concept of interconnection payment is likely to change as we move into an IP environment
  - More fixed charges between operators based on capacity
  - Fewer variable charges based on the volume of traffic
  - Overall value of interconnection payments between operators may reduce
- Voice remains to be the main revenue source for operators
- Voice revenues continue to drive investments
- Customer relationships
  - Need for single billing relationship with a network operator
  - Ability to develop many billing relationship with service providers
  - Ability to obtain the same services though different network operators in different locations




*Source:IDATE*

# Implications for future regulation

➢ Technology Implications on Price Setting

- Developments of infrastructure
- All over IP
- Convergence
- Changing market structure

• Very similar services are being provided via deferent infrastructures - different cost structures

• Separation of networks and services

• Many different products offering similar facilities – different pricing

• More competition – less price regulation

# Implications for future regulation

- The move to NGN's provides an opportunity to change pricing models:

| Volume based | Event based | Content/Value based |
|---|---|---|
| User pays per kbit/s or Mbit/s of data sent or received<br><br>No charge if link not in use – not time related<br><br>Pay in additional for content e.g. video, music<br><br>Charging methods<br><br>•Only per kbit/s<br><br>•Bundles of X MB per month | User pays per event, current examples are per SMS, MMS, song<br><br>Off peak voice move to per event charge, e.g. BT retail on-net local, national calls<br><br>Users have direct charging relationship with content providers<br><br>Per event charging related to premium content, e.g. premiership football matches | Targeting specific customers<br><br>Based on demand, quality, customer loyalty<br><br>Not necessarily linked to data volume or time on network<br><br>Could be applied to event based model<br><br>Issues for interconnection:<br><br>•Quality<br><br>•Network availability |

# Implications for future regulation

➢ Technology Implications on Interconnection regulation

- Developments of infrastructure
- All over IP
- Convergence
- Changing market structure

→

- Need for different types of interconnection
- Interconnection of IP networks becomes crucial issue
- Interconnection between new services, platforms
- New imbalances in payments

# Implications for future regulation

➢The difference in nature of networks recalls regulators to review regulations principles and to evaluate how to migrate to the NGN environment with minimum distortions for the market, while at the same time preventing any disruptions to competition:

- **What price to set for interconnection? Which regulatory approach to adopt? Who sets rate?**

  Regulators: Expensive proceedings to set cost-based rates

  Markets: Arbitrage enforces “Law of One Price”

  Negotiated: mandate “reciprocal compensation”

- **Which party pays?**

  Calling (Sending) party pays: problem of mobile termination

  “Bill and Keep”

# Implications for future regulation

- NGN interconnection options:
  - Transposition of current regulatory approaches;
  - Replication of new retail pricing methods at the wholesale level;
  - Flexible approach:
    - Because retail pricing models and cost conditions might vary across services, markets ant networks, there probably will be no single *"One size fits all"* interconnection models that maximizes efficiency in all situations.
    - Dynamic effect must be taken into account.
    - Maybe a variety of models employed across different circumstances could be the best promoter of efficient market?

# Conclusions

- Migration to NGN will not make concerns over SMP disappear at least in short - medium term, therefore efficient regulation will still be an issue.
- The efficient regulatory model to wholesale pricing can generally be derived from two factors - the efficient retail price and the distribution of costs.
- NGN will carry a wide range of services with diverse pricing models. Wholesale pricing models must support that diversity:
  - Trends toward bundling and flat-rate pricing in retail market could be mirrored by capacity-based pricing in wholesale market
  - Wholesale charges will need to take traffic and quality into account in order to provision efficient networks
  - Voice, which remains to be the main source of revenue and investments, has well-accepted retail charging model
  - No single IP interconnection model is superior in all circumstances
- Move to IP likely to affect wholesale cost accounting models.

# Conclusions

- Regulators should therefore be cautious in imposing any particular NGN interconnection regulation as it might be fraught with risk.

- Maybe a variety of models employed across different circumstances could be the best promoter of efficient market? Rather then determine a particular approaches to interconnection regulation or transpose them from today's to NGN interconnect environment, maybe regulators should set out the criteria against which they would evaluate the models?

- The main criteria:
  - Whether the model would advance efficient outcomes for consumers? Whether it would maximise consumers utility?

# Thank you

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