Regulatory environment for fixed-mobile interconnection


The views expressed in this paper are those of the authors and do not necessarily reflect the opinions of the ITU or its Membership. The authors can contacted by e-mail at Tim.Kelly@itu.int and Lara.Srivastava@itu.int. The research presented is based on the input documents and outputs of a workshop on fixed-mobile interconnection, held at the OECD, September 2000. That meeting was chaired by Prof. Rohan Samarajiva.
Agenda

• A mobile revolution
  - Worldwide
  - Europe

• Fixed-mobile interconnection
  - Calling Party Pays vs. Receiving Party Pays
  - The problem of the “market of one”
  - Interconnection rate comparisons

• Country case studies
  - India, Uganda

• Implications for public policy
  - Is this an example of market failure?
A Mobile Revolution

Fixed Lines vs. Mobile Users, worldwide, Million

Source: ITU World Telecommunication Indicators Database.
Relationship between teledensity and mobile density, Europe, 1/1/00

Source: ITU World Telecommunication Indicators Database.
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Calling opportunities worldwide

1993
- Fixed-to-fixed: 89.7%
- Fixed-to-mobile: 5.0%
- Mobile-to-fixed: 0.3%
- Mobile-to-mobile: 5.0%

1998
- Fixed-to-fixed: 52.7%
- Fixed-to-mobile: 19.9%
- Mobile-to-fixed: 7.5%
- Mobile-to-mobile: 19.9%

2003
- Mobile-to-fixed: 25.0%
- Mobile-to-mobile: 26.7%
- Fixed-to-fixed: 23.4%
- Fixed-to-mobile: 25.0%

Source: ITU Fixed-Mobile Interconnect website: http://www.itu.int/interconnect
Fixed-Mobile Interconnection

- Interconnect prices are a major determinant of retail prices
- Evidence of “market failure”
  - Interconnect prices are variable but generally very high, especially in Europe
  - In Calling Party-Pays environments, caller may not be aware of the charge they will be paying
  - Calling party does not have a choice of operator to terminate the call
- Fixed-to-mobile and mobile-to-fixed interconnect rates are highly asymmetric
- By 2003, 75% of all calls worldwide will involve a mobile
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Elements of a Fixed to Mobile call

Call Origination
- Orig. Access Switching
- Authentication

Transit service
- Core Network Switching

Call Termination
- Locating the Customer Switching
- Term. Access

Source: Adapted from ECTA.
The competitive cascade

1. **Subscriptions**
   - National roaming; Mobile number portability
   - Indirect access
   - Wholesale prices linked to retail tariffs for mobile-originated calls

2. **Retail calls**
   - Origination
   - Termination

Source: Ovum.
RPP vs. CPP: What’s the difference?

**Receiving Party Pays**
- Mobile party pays for incoming calls and fixed party pays only local tariff
- Often, no interconnect arrangement is negotiated with the fixed operator for F-M calls. Mobile operators bill mobile consumer directly for “airtime”.

**Calling Party Pays**
- Mobile party does not pay for incoming calls and fixed party pays a premium to call the mobile party
- Call termination paid by fixed operators is a significant part of mobile operator revenues
Fixed/Mobile interconnect rates in selected calling-party-pays countries, US$ per minute

- **Costa Rica**: 0.017 Mobile-to-fixed, 0.017 Fixed-to-mobile
- **Malaysia**: 0.034 Mobile-to-fixed, 0.034 Fixed-to-mobile
- **Guatemala**: 0.047 Mobile-to-fixed, 0.047 Fixed-to-mobile
- **Mexico**: 0.026 Mobile-to-fixed, 0.064 Fixed-to-mobile
- **Cambodia**: 0.050 Mobile-to-fixed, 0.070 Fixed-to-mobile
- **Dominican Republic**: 0.042 Mobile-to-fixed, 0.078 Fixed-to-mobile
- **Philippines**: 0.051 Mobile-to-fixed, 0.205 Fixed-to-mobile
- **Botswana**: 0.052 Mobile-to-fixed, 0.208 Fixed-to-mobile
- **Antigua**: 0.293 Mobile-to-fixed, 0.293 Fixed-to-mobile

Source: ITU Regulatory Questionnaire Survey.
Fixed-to-mobile interconnection rates, Europe, US$ per minute

- Norway: 0.156
- UK: 0.16
- Denmark: 0.17
- Netherlands: 0.18
- Belgium: 0.18
- Spain: 0.20
- France: 0.20
- Finland: 0.21
- Sweden: 0.22
- Austria: 0.23
- Italy: 0.23
- Germany: 0.24
- Switzerland: 0.30

Source: ITU, compiled from ECTA/Analysys, EU Interconnection Tariffs in Member States, ITU Regulatory Survey 2000
Asymmetries: Range of Interconnection rates in EU, US$ per minute

Mobile termination is out of line with costs (even if costs are overestimated!)

- Higher costs of financing
- Less economy of scale
- Higher cost technology

Ratio of mobile to fixed costs: 6:1 - 9:1

Actual interconnect charges: 16:1

Source: Ovum/EU.
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Sample prices in RPP environments, in US$ per minute

<table>
<thead>
<tr>
<th>Country</th>
<th>Mobile-to-fixed interconnect rate</th>
<th>Fixed-to-mobile interconnect rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>0.002</td>
<td>0.001</td>
</tr>
<tr>
<td>Canada</td>
<td>0.007</td>
<td>0.000</td>
</tr>
<tr>
<td>HK SAR</td>
<td>0.008</td>
<td>0.008</td>
</tr>
<tr>
<td>Singapore</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>0.009</td>
<td>0.000</td>
</tr>
<tr>
<td>USA</td>
<td>0.020</td>
<td>0.020</td>
</tr>
</tbody>
</table>

Average

<table>
<thead>
<tr>
<th>Environment</th>
<th>Mobile-to-fixed interconnect rate</th>
<th>Fixed-to-mobile interconnect rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>RPP</td>
<td>0.009</td>
<td>0.005</td>
</tr>
<tr>
<td>CPP</td>
<td>0.056</td>
<td>0.092</td>
</tr>
</tbody>
</table>

Source: ITU Regulatory Questionnaire Survey.
Case Study India: The context

- Teledensity 2.4%
- Local market liberalized first, then long distance
- Mobile Sector opened up in 1994
- The Dept. of Telecommunications was both licensor and incumbent operator until late 1999
- Regulator TRAI created in 1995
Case Study India: The Mobile Sector

- 34 mobile operators in circles (provinces) and 8 in metros
- More than 3 million subscribers in Dec 2000
  - Growth of > 50% a year since March 1997
  - Mobile density around 0.3%
- In the circles, mobile network development is patchy
  - Mobile operators rely on the incumbent (DoT/DTS) to carry much of their traffic
  - ...and incumbents launched their own mobile services in Metros & Circles in 2000
Case Study India: Attempt at CPP

- Interconnection - main stumbling block for development of mobile in India

- Only mobile operators pay to interconnect
  - DoT/DTS pays no access charges for F-M calls
  - Mobile operators obliged to use DoT/DTS network, but have only limited access to it (via Pols)
  - Compromise proposed over WLL access

- TRAI attempted to introduce CPP “revenue-sharing” scheme, but failed. Now trying again
  - Delhi High Court found that TRAI lacked jurisdiction
  - January 2000: TRAI Act amended
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Case Study Uganda: Mobile rapidly overtaking fixed

- Subscribers

<table>
<thead>
<tr>
<th>Year</th>
<th>Fixed line voice</th>
<th>Mobile</th>
<th>Internet</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994</td>
<td>30,000</td>
<td>10,000</td>
<td>5,000</td>
</tr>
<tr>
<td>1995</td>
<td>40,000</td>
<td>20,000</td>
<td>10,000</td>
</tr>
<tr>
<td>1996</td>
<td>50,000</td>
<td>30,000</td>
<td>15,000</td>
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<tr>
<td>1997</td>
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<tr>
<td>1998</td>
<td>70,000</td>
<td>50,000</td>
<td>25,000</td>
</tr>
<tr>
<td>1999</td>
<td>80,000</td>
<td>60,000</td>
<td>30,000</td>
</tr>
</tbody>
</table>

3 operators:
- MTN Uganda
- Celtel
- UPTL

Privatisation of UPTL in 2000

Independent Regulator (UCC)

Source: ITU Internet diffusion case study of Uganda, www.itu.int/ti/casestudies
Uganda: Changing balance of power in calling opportunities, Dec. 1999

Source: ITU Internet diffusion case study of Uganda, www.itu.int/ti/casestudies
Operators can always blame high prices on someone else:
- Mobile service providers blame other operators for high roaming charges
- Fixed-line service providers blame mobile operators for high termination charges

Regulators are cautious to act:
- Mobile service is competitive, isn’t it?
- Don’t rock the boat when mobile operators are recycling profits in high prices for 3G spectrum

Users are confused:
- Telephone prices are falling but not telephone bills
- To whom do we complain?
Case studies

- Finland
- India
- Mexico
- China/HK