Economic aspects of fixed-to-mobile interconnection

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Agenda

- A mobile revolution
  - Worldwide
  - Asia-Pacific
- Fixed-mobile interconnection
  - Calling Party Pays vs. Receiving Party Pays
  - The problem of the “market of one”
  - Interconnection rate comparisons
- Country case studies
  - India, Hongkong SAR
- Looking ahead
  - Interconnection issues with 3G Mobile
A Mobile Revolution

Fixed Lines vs. Mobile Users, worldwide, Million

Source: ITU World Telecommunication Indicators Database.
Relationship between teledensity and mobile density, Asia, 1/1/01

Source: ITU World Telecommunication Indicators Database.
Calling opportunities worldwide

Source: ITU Fixed-Mobile Interconnect website:  http://www.itu.int/interconnect
Average retail prices

<table>
<thead>
<tr>
<th>Country/Region</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany (D2)</td>
<td>$61.91</td>
</tr>
<tr>
<td>Spain (Plan 7500)</td>
<td>$50.20</td>
</tr>
<tr>
<td>Egypt (Click)</td>
<td>$48.11</td>
</tr>
<tr>
<td>Argentina (Miniphone)</td>
<td>$45.20</td>
</tr>
<tr>
<td>UK (Orange)</td>
<td>$41.40</td>
</tr>
<tr>
<td>World Average</td>
<td>$38.15</td>
</tr>
<tr>
<td>Brazil (Telesp)</td>
<td>$38.15</td>
</tr>
<tr>
<td>Chile (Entel PCS)</td>
<td>$35.34</td>
</tr>
<tr>
<td>USA (Bell South)</td>
<td>$26.07</td>
</tr>
<tr>
<td>Canada (Bell Mobility)</td>
<td>$25.00</td>
</tr>
<tr>
<td>Hong Kong SAR (HKT)</td>
<td>$23.59</td>
</tr>
<tr>
<td>Philippines (Globe)</td>
<td>$21.69</td>
</tr>
<tr>
<td>India (Max Touch)</td>
<td>$16.26</td>
</tr>
<tr>
<td>China (China Telecom)</td>
<td>$14.30</td>
</tr>
<tr>
<td>Indonesia (Satelindo)</td>
<td>$10.87</td>
</tr>
</tbody>
</table>

Note: Excludes charges for incoming calls in RPP markets.

Price of monthly subscription plus 100 minutes of mobilephone calls in US$, August 1999
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 call opportunities worldwide will involve a mobile
Elements of a Fixed-to-Mobile call

Source: Adapted from ECTA.
The competitive cascade

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

<table>
<thead>
<tr>
<th>Country</th>
<th>Mobile-to-fixed rate</th>
<th>Fixed-to-mobile rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antigua</td>
<td>0.293</td>
<td>0.293</td>
</tr>
<tr>
<td>Botswana</td>
<td>0.052</td>
<td>0.208</td>
</tr>
<tr>
<td>Cambodia</td>
<td>0.050</td>
<td>0.070</td>
</tr>
<tr>
<td>Dom. Rep.</td>
<td>0.042</td>
<td>0.078</td>
</tr>
<tr>
<td>Philippines</td>
<td>0.051</td>
<td>0.205</td>
</tr>
<tr>
<td>Guatemala</td>
<td>0.047</td>
<td>0.047</td>
</tr>
<tr>
<td>Mexico</td>
<td>0.026</td>
<td>0.064</td>
</tr>
<tr>
<td>Malaysia</td>
<td>0.034</td>
<td>0.034</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>0.017</td>
<td>0.017</td>
</tr>
</tbody>
</table>

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
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

Note: This applies to CPP (Circuit Provided by Provider).
Sample prices in RPP environments, in US$ per minute

<table>
<thead>
<tr>
<th>Country</th>
<th>Mobile-to-fixed</th>
<th>Fixed-to-mobile</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>0.001</td>
<td>0.002</td>
</tr>
<tr>
<td>Canada</td>
<td>0.000</td>
<td>0.007</td>
</tr>
<tr>
<td>HK SAR</td>
<td>0.000</td>
<td>0.008</td>
</tr>
<tr>
<td>Singapore</td>
<td>0.008</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

Mobile-to-fixed interconnect rate
Fixed-to-mobile interconnect rate

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 Telecoms was both licensor and incumbent operator until late 1999
- Regulator TRAI created in 1995

2.4% World’s Surface
1 billion people or 16.7% of World
34% Poverty
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
Case Study, Hongkong SAR

- Became a Special Administrative Region on 1/7/97
- 6.8 million pop.
- Mobile competition since 1987
- Currently 6 main operators
- Mobile density >80 per 100 inhabitants
- Private and foreign ownership permitted

Mobile operator’s market share (1/1/01)
Hongkong SAR, Fixed-to-Mobile interconnection

- Clear and transparent statement of regulations
  - Statement No. 7, (June 1995) sets out framework for carrier to carrier charging principles

- Principle of cost-orientation
  - When requested to provide information, incumbent operator (PCCW) must provide detailed cost breakdown, according to OFTA’s cost manual.
  - Interconnect charges are US$10 per month per 64 kbit/s line plus 0.8 US cents per minute.

- Number portability
  - Introduced in March 1999
  - Has permitted greater user choice and has spurred market growth
Looking to the future

- Licensing of 3G systems and development of mobile Internet
  - Choice of standards
  - Choice of method for allocating licences
  - How many operators?

- Mixed success for 2G mobile Internet
  - Huge success of i-Mode in Japan
  - Disappointing take-up of WAP in Europe

- Difficult to reconcile business models
  - Mobile voice charged by the minute
  - Internet access charged on a flat-rate basis

- Roaming issues
  - 3G is intended to permit global roaming
  - But, in Europe, EU competition policy authorities are conducting an inquiry into excessive roaming charges and recently conducted a series of raids on mobile operators
Implications for public policy

- Big difference between CPP and RPP
  - CPP environment appears more favourable to market growth
  - But CPP mobile operators frequently charge above-cost prices for interconnection

- Regulators hesitant to intervene
  - Mobile perceived to be an open and competitive market
  - But, evidence of market failure in call termination rates

- 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
For more information ... ITU Website at www.itu.int/interconnect

Case studies

- Finland
- India
- Mexico
- China and Hongkong SAR
- Malaysia

... and on the licensing of 3G mobile at www.itu.int/3G