3G LICENSING IN CHINA & HONG KONG

Xu Yan (xuyan@ust.hk)
Hong Kong University of Science and Technology

Growth of Mobile Users in China

Growth of cellular subscribers in China
(Source: The Ministry of Information Industry)
Changes in ARPU and MOU of China Mobile (HK)

Source: Annual Reports of China Mobile (HK)

Explosive Growth of SMS

Source: China Mobile (HK) Annual Report

Plus 2.27 million MMS since the service was launched in October 2002
Model of B2B Mobile Commerce: The Case of Cyber-on-Air

China is Calling for 3G

- Feasibility: SMS shows the demand to mobile data communication is encouraging
- Urgency: The slow speed is currently a bottleneck for the application of mobile data communications
**Spectrum Auction is not an Option**

Global Trend of 3G Auction Price (Euro, million)

**Spectrum Occupation Fee:**
**US$6.06 Per Subscriber Per Year**

Department of Radio Administration, Ministry of Information Industry
New Initiative on Spectrum Fee

- Operators are asked to pay the spectrum fee directly and spectrum occupation fee will be suspended from 1 July 2002
- Price is defined by regulator in the way of benchmarking
  - 7.5 million Yuan (US$0.91 million) per MHz in the first year, 11.25 million Yuan (US$1.36 million) per MHz in the second year, and 15 million Yuan (US$1.82 million) per MHz in each of the third, fourth and fifth years.

Key Question in 3G Licensing: Which Standard to Use?

- CDMA2000
- WCDMA
- TD-SCDMA
FDI in Telecom Manufacturing

- No digital system before 1982
- Equipment import boom after Fujian installed the first SPC switch of Fujitsu
- Policy of using market in exchange for technology: import, digestion, absorption and creation
- joint ventures were highly encouraged with agreement on technology transference: Shanghai Bell was established in 1984

Government’s Support To Domestic Vendors

- assignment of research grant for R&D
- low interest loans
- discounted tax rates
- generous provision of land in high-tech industrial parks
- Operators are encouraged to purchase products of domestic vendors: Supply-demand coordination conference
Government Intervention

- “Government Guideline for Foreign Investment in Telecommunications”
- Three categories of FDI (1995):
  - Encouraged: Digital Cellular, SDH, ATM switching system, satellite communications system, digital microwave system
  - Restricted: analogue wireless system, PABX, non-ATM central office switches, TV and Radio Broadcasting systems, Fax machines, low speed digital microwave system
  - Forbidden: Telecom operation

Ju Da Zhong Hua: Julong, Datang, Zhongxing (ZTE) and Huawei.

- In 1992, the first SPC of 10,000 lines was made in China with China-owned intellectual property rights
- In 1998, 98% of the newly increased switching equipment for fixed local networks and 50% of newly increased optical transmission system.
- In 1999, the market share of local vendors in switching equipment rose to over 99%.
- In 1999, the total revenues from exporting telecommunication equipment and systems reached US$ 46.6 billion
In 1999, the total revenues from exporting telecommunication equipment and systems reached US$ 46.6 billion.

Growth of market share of Chinese domestic vendors in mobile equipment supply

Source: Ministry of Information Industry of China
**Strategies of Local Handset Manufacturers**

- Good after-sale service quality
- Low price
- Target the urban area from country-side
- High class: diamond handset of TCL999D
  - However, billions were paid for IPR

**CDMA: A Short-cut?**

- Unicom Horizon: a CDMA network of China Unicom
- ZTE: 7.5% market share.
- Future CDMA2000: avoid the opportunity cost
- Local CDMA handsets: 18 licenses to local venders (but all have foreign partners) except MOTOROLA
TD-SCDMA: Can a Dream become True?

- What is TD-SCDMA
  - Proposed by Datang
  - One of the three 3G standards of ITU
  - First ITU standard proposed by China
  - Asymmetric transmission
  - Software-defined radio
  - Efficient spectrum usage
  - Smart antenna
  - Smooth migration from 2G to 3G
- Close cooperation with Siemens

Implications of 3G Licensing in China

- TD-SCDMA is a chance for domestic manufacturers
- Government is supportive in the way of favorable spectrum allocation
- However, it remains to see if it will turn out to be a mature technology for commercial application
- Time is important
Policy Objectives of Hong Kong Government in 3G Licensing

- To promote the development of telecommunications industry;
- To protect consumers’ interests; and
- To maximise the benefits to the economy as a whole

Key Issues in Debate

- Choice of technical standards,
- Allocation of radio spectrum
- Licensing options
- Open network requirement
Choice of Technical Standards

- Technology neutral
- Various technical standards are compatible with each other from the user’s point of view
- Smooth deployment of number portability
- Maximize the ease and practicality of roaming services without having to change mobile terminals

PCCW: Guard band issue

Competitive 2G Mobile Market in Hong Kong (January 2001)

<table>
<thead>
<tr>
<th>Operator</th>
<th>CSL</th>
<th>Hutchison</th>
<th>Smartone</th>
<th>Mandarin (Sunday)</th>
<th>New World</th>
<th>People’s Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market Share</td>
<td>18%</td>
<td>30%</td>
<td>17%</td>
<td>7%</td>
<td>14%</td>
<td>14%</td>
</tr>
<tr>
<td>Technology</td>
<td>GSM</td>
<td>DAMP PCS</td>
<td>GSM PCS</td>
<td>PCS</td>
<td>PCS</td>
<td>PCS</td>
</tr>
<tr>
<td></td>
<td>CDMA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Allocation of Radio Spectrum**

- 2G licensee can use current spectrum for 3G services: technology neutral
  - Guaranteed 3G license?
  - High spectrum fee for 3G but low spectrum fee for 2G?

**Licensing Options**

- Traditional 2G licensing in HK:
  - Concerns over 2G licensing
    - License fee may be undertaken by users finally
    - Increase licensee's burden
  - Solutions:
    - Setting Milestones
    - Using Performance Bond
3G Licensing

Argument
- Who can set the most appropriate milestone for 3G?
- User should pay for public resource?
- Capitalism should at work?
- Auction but under different condition?
- Cross subsidization?
- Government share the risk with investor?

Royalty Payment
**Royalty Payment Scheme**

- Actual Payment over Time
- Actual royalty payment
- Minimum defined payments

**Open Network**

- Successful 3G service bidders must open up at least 30% of their 3G network capacity for use by unaffiliated companies to operate Mobile Virtue Network and/or content providers.

- **Argument:**
  - Speculation?
  - How to measure the capacity?
Results of 3G Auction in Hong Kong

- Winners of Mobile Carrier Licenses in Hong Kong
  - Hong Kong CSL
  - Hutchison
  - Smartone
  - Sunday
- Minimum Payment in first five years:
  - HK$50,000,000 per year.
- Percentage of revenue for licenses
  - 5%

For more details:

Thank You!