Spectrum Policy Innovation

IIC Asia Forum - Spectrum Policy: A Way Forward
28 November 2012

John Ure
Director, TRPC Pte Ltd (Singapore)
Associate Professor and Director
Technology Research Project (TRP)
Social Science Research Centre
University of Hong Kong
Agenda

Note: The full 2010 presentation can be found at ‘Spectrum Liberalization’ http://trpc.biz/spectrum-liberalization/

1. Issues
   • Liberalisation
   • Sharing
   • Trading

2. Summary of Experience:
   Based on Australia, New Zealand, FCC, Ofcom, EU, Norway, El Salvador, Guatemala)

3. Conclusions
Ofcom will allow spectrum trading for 900MHz, 1800MHz and 2100MHz public wireless networks

Ofcom (2011) ‘Notice of proposals to make 900 MHz, 1800 MHz & 2100 MHz public wireless network licences tradable: Consultation’

“Spectrum is a valuable and finite resource. Its use underpins about 3% of UK GDP and is worth over £40bn a year to the economy. Spectrum trading is an important mechanism for securing its optimal use for society. Trading allows spectrum to migrate to those that can generate greater benefits for citizens and consumers. Spectrum trading promotes innovation and growth by opening up opportunities for businesses to gain access to the radio frequencies that they need. The ability to trade spectrum is therefore critical to securing maximum benefit for society”.

Liberalisation: Trading & Services

Trading

1. Liberalisation = allocation by the market
   • Interference alleviation by negotiation? By use of cognitive radio, etc?
2. Trading = assignment by the market
   • Regulatory limits?

Services

1. Any permitted service
   • Unified and “class” licences assist flexibility
2. Inband and outband non-interference issues
   • Negotiation, regulation and/or technologies
3. Unlicensed spectrum where transaction costs are high and demand is low
   • Encourages innovative use of technologies, e.g. WiFi, UWA, etc.
   • Encourages services to areas of low commercial value, e.g. rural
Liberalisation of Frequency

- Any permitted frequency
  - Requires national spectrum commitments to reduce investment risk

- Refarming is made easy
  - Overcomes ‘disruption’ of new technologies
  - But opens up questions of terms and conditions of usage – e.g. changing spectrum prices?

- Spectrum trading facilitates change of spectrum use
  - Frequencies change to higher-value usage
  - Leasing out under-utilized frequencies can bring in marginal revenues to property-rights owners – e.g. utilities in USA

- Harmonisation (roaming) can be disrupted unless protected
  - Difficult across the EU
  - Difficult for HK and mainland China?
Trading as Liberalisation of the Market

- Any *permitted* user
- Allows new entry = buy (part or all) vs. lease (part or all - eg. MVNO) vs. share (part or all as JV, etc.)

**Figure 2: Modes of trading spectrum**

- **Outright transfer**
  - Total transfer: $X \rightarrow Y$
  - Partial transfer: $X \rightarrow X + Y$

- **Concurrent transfer**
  - Total transfer: $X \rightarrow X + Y$
  - Partial transfer: $X \rightarrow X + X + Y$

Ofcom “Simplifying Spectrum Trading”

Trading Spectrum in Packages

Figure 2 Different ways that a spectrum licence can be traded

A = geography; B = bandwidth; C = A+B; D = C + ΔA +ΔB

Source: Australian Communications Authority (2004). Available at http://www.aca.gov.au

Most Likely Trades?

**Fixed Wireless**
- Backhaul capacity
- Local loop access
- Satellite services
- Grid services

**Wireless mobile**
- MVNOs
- ASPs/ISPs
- Content providers

**Geography**
- Sub-divisions of wide areas
- Metro, urban or rural areas

**Bandwidth**
- Excess capacity
- Redundant capacity

**Technologies**
- Substitution
- New markets
## Experience

### Markets approaches

- Liberalisation – limited examples
  - Trading – only partial even where it is permitted
    - Auctions = already efficient?
    - Other reasons, such as size of market, regulatory risk, transactions costs, etc.

- NRAs allow selective changes of ownership or usage, e.g.
  - Re-farming by permission in HK, Japan, Malaysia, Singapore, etc.

### Countries

- New Zealand = first to liberalise, followed by:
  - Australia
  - FCC (USA)
  - Guatemala & El Salvador
  - Norway
  - UK
  - EU
1. Evidence for **liberalisation** from Central America is ambiguous
   → It works, but so do other regimes?

2. Most **trading** in PCS/BFWA bands in Australia, USA and UK

3. The **transactions costs** for trading (e.g. the regulatory approvals process) need to be minimal
   → Many other factors not dealt with here

1. **Consumer surplus** in UK shown to be highly concentrated in public mobile

2. **Liberalization/trading** sure to grow, but so too their opposite, the **commons**

3. **Sharing** (private or community) looks set to grow

4. And the **rentier model** serves well, but needs more flexibility
THANK YOU

johnure@trpc.biz