Can spectrum auctions deliver universal access to next generation wireless broadband?

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Promoting universal access to wireless broadband

- Recent trend towards regulators attaching significant coverage obligations to mobile broadband licences

- Departure from trend away from policy intervention in spectrum markets seen in early 2000s:
  - Auctions of technology neutral licences
  - Few licence obligations
  - Let the market decide

- Reflects policy focus on broadband availability and recognition of LTE as cost-effective alternative to fixed line, especially in rural areas:
  - Coverage obligations focused in scarce sub-1GHz frequencies
  - Increasingly creative methods for:
    - allocating obligations to specific operators
    - ensuring coverage of most remote regions
Examples of tools available to policy makers

- Denmark 800 MHz (CCA)
  - Full package bid auction
  - Coverage exemptions are available for three rural “regions”
  - Winner determination restricted such that at least one operator covers every region

- Germany 800/2100/2600 MHz (SMRA)
  - Restricted use of 800 MHz blocks in urban areas until coverage obligations in rural areas have been met
  - 800 MHz operators share rural rollout obligations

- Romania 800/900/1800/2600 MHz (variant of Clock Auction)
  - Obligation to cover 100s of rural regions divided up amongst 800/900 MHz winners based on number of blocks they win
  - Some scope for winners to choose coverage regions, provided none left out
Another example: Sweden 800MHz auction

- Styled as **hybrid ‘auction-beauty contest’ format**
  - More properly, an **auction with multiple characteristics** (price and promised expenditure on rural coverage obligation)
  - For lot 6, **first SEK 300m of any bid is commitment to spend on roll-out to households in rural areas** (as defined by the regulator)

- **SMRA with switching format:**
  - ‘Switching rule’ to manage bidder exposure to winning non-contiguous spectrum
  - Cap of 2 lots (2x10MHz) per bidder
  - Restricted transparency aimed at preventing tacit coordination
## Sweden 800MHz - outcome

- Five bidders for 6 lots with leading bidders all targeting 2 lots each
- Three incumbent bidders each won 2x10MHz, but at very different prices
- Some interesting features:
  - Two incumbents - Telenor and Tele2 - formed a JV (Net4), which won lot 6
  - Lowest two lots sold at significant discount
    - These lots significantly cheaper than coverage obligation lot
    - Can only partially be explained by concern about interference from DTT in lot 1
    - SMRA switching format only partially mitigates aggregation risk, so this may also drive uneven prices (end blocks are more risky as only join one other block)

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<th>Lot</th>
<th>H3G</th>
<th>H3G</th>
<th>Telia</th>
<th>Telia</th>
<th>Net4</th>
<th>Net4</th>
<th>11 MHz centre gap</th>
<th>SEK 165m</th>
<th>SEK 266m</th>
<th>SEK 386m</th>
<th>SEK 468m</th>
<th>SEK 420m</th>
<th>SEK 49m + 300m*</th>
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* SEK 300m expenditure on rural coverage
Two common themes in Europe

- Integrate coverage obligations into spectrum auction rather than run separate process to allocate funds to rural coverage
  - Contrast to USA, where FCC exploring scope for reverse subsidy auctions, which are separate from spectrum allocation

- Avoid expensive duplication of infrastructure roll-out in rural areas
  - In the Sweden 1800 MHz auction this was achieved by lot design (only coverage requirements on one lot)
  - In the German multi-band auction, this is done through co-ordination between operators
  - In the Danish 800 MHz auction, this is achieved by restrictions on winner determination in a CCA
  - In the Romanian multi-band auction, this is achieved by a mix of voluntary selection of coverage areas and obligations imposed by random selection
Topics to explore

- Is there a best approach to coverage obligations in auctions – or should they be specific to local conditions?
  - How do you define broadband speeds and availability in a meaningful way?
  - Is universal mobile coverage a realistic goal?
  - What is the best way to avoid duplication of expensive infrastructure in rural areas?

- Does the best approach vary depending on:
  - Whether this a single or multi-band auction?
  - The choice of auction format – e.g. CCA vs SMRA?

- Can coverage obligations distort choice of deployment across different spectrum bands?

- What impact do coverage obligations have on auction revenues?
Thank you!

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