

HOW TO ENGAGE IN BROADBAND POLICY AND REGULATORY PROCESSES

POLICY/REGULATORY QUESTIONS AMENABLE TO EVIDENCE

SESSION 9, APRIL 7, 2013

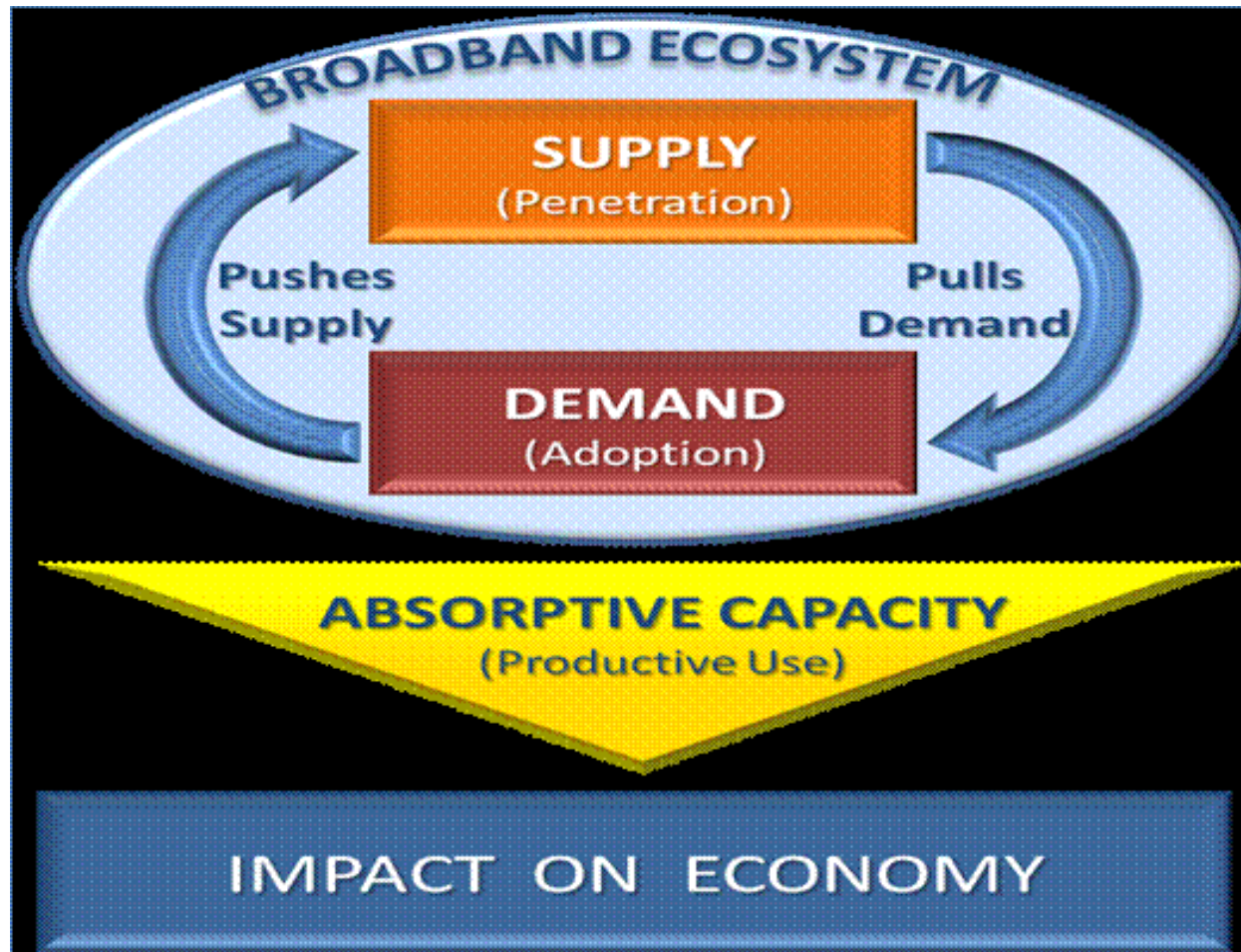
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Broadband Ecosystem

- Broadband infrastructure must be available
- Demand equally important for viable investments
- ✓ ability for non-ICT sectors to use and create broadband-enabled services and applications
- ✓ encourages further network deployments
- Developing these synergies important
- ✓ extent to which broadband impacts the economy
- ✓ serves as an enabling platform
- ✓ as a GPT for innovation and growth in all sectors

Broadband Ecosystem



Research can help...

- How to get the ecosystem in place?
- How to remove the supply side constraints?
 - ✓ international connectivity
 - ✓ domestic backbones
 - ✓ metropolitan and backhaul connectivity
 - ✓ local connectivity
- Not just more networks
- How best to bring access to a nation's citizens.
 - ✓ issues of cost, service quality (bandwidth/data speeds)
 - ✓ technology choice

To provide evidence...

- What is the best way of broadband diffusion?
- ✓ is fiber optics to virtually all homes a sensible policy goal?
- ✓ mobile broadband may have a disruptive effect on the overall broadband market
- ✓ wireless networks cannot currently offer the same capacity as fiber networks
- ✓ viewed as complements to fiber networks
- Have wireless networks been prematurely dismissed as viable future broadband infrastructure?

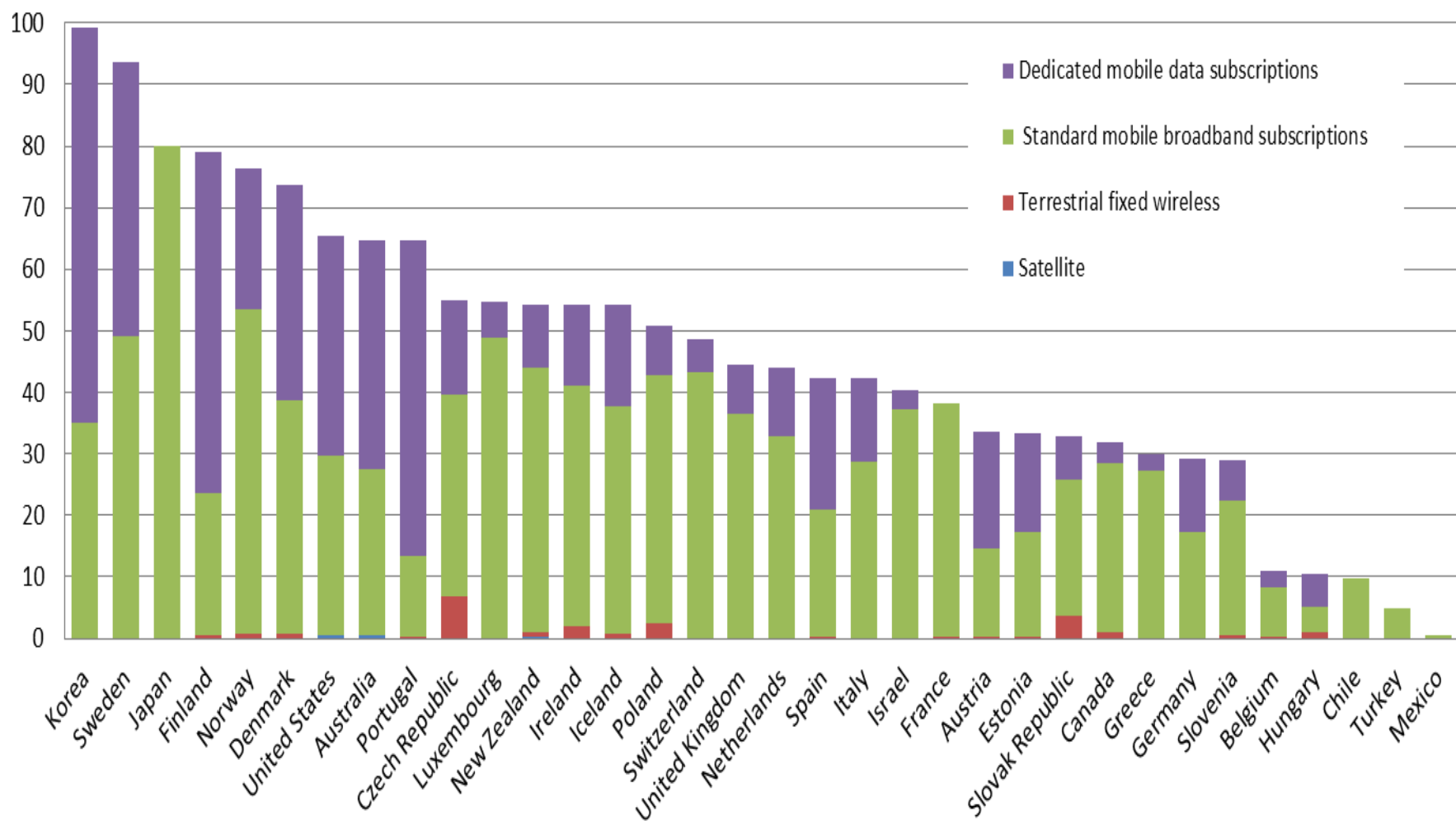
How do you decide??

- Wireless networks cannot match the capacity of fiber
- Wireless broadband services are often more expensive
- Interference issues
- ✓ FTTH less susceptible
- ✓ Technologies being developed that minimize interference
- Standard fiber optic connection over 66 times faster than its wireless
- ✓ Who needs that much of speed?
- New technological trajectory
- ✓ Access in many locations over fixed connectivity
- ✓ Does not require the speed and reliability of fiber?

Cannot avoid this evidence...

- Wireless broadband subscribers driving growth in high-speed Internet access in OECD countries
- New wireless broadband subscriptions double digit growth
 - ✓ rising by 14% from the last half of 2010
- Fixed wired broadband subscriptions increased by 2.25% between December 2010 and June 2011
- Korea (99.3), Sweden (93.6), Japan (80.0) and Finland (79.1) wireless broadband penetration
 - ✓ some of them nearly doubling the OECD average of 47.9
- Services supporting healthcare and education are being delivered successfully outside the home
- Worth questioning the assumption?

OECD wireless broadband subscriptions per 100 inhabitants, by technology, June 2011



Can this be replicated in South Asia?

- Could wireless BB really be a substitute to the FTTH or any other fiber centric policies?
- Wireless is considered by many to be ideal in South Asia
- ✓ No legacy wired networks
- India about 86% of 12.83 million broadband connections are provided using DSL technology and 2.85% using wireless
- If DSL remains the predominant technology, only 22.2 million broadband connections by 2014

Things are changing (e.g.India)

- 42.79% of total wireless subscribers base are capable of accessing data services/Internet (374 million, However, 2g)
- High growth of data subscribers, capable of using Internet through mobile devices, makes available a ready population which could adopt broadband
- TRAI : Contribution of wireless broadband technologies by the year end 2014 is expected to be 59.6 million subscribers respectively

Policy challenges arising from “wireless broadband revolution”

- Mobile is an alternative but it needs spectrum
- Spectrum shortage driving up the costs of deploying competitive 4G mobile broadband networks
- Allocating sufficient spectrum to maintain the current level of competition appears infeasible
- ✓ Should spectrum be allowed to be shared between operators
- ✓ If so then does it impede competition
- What are the solutions?

How to deal with Spectrum Scarcity?

- Current scenario
- ✓ Infrastructure-based providers of high-grade services - exclusively licensed spectrum
- Question: Is it possible to allocate sufficient additional spectrum and maintain the current level of competition under the current industry structure?
- Spectral Efficiency vs. competition
- What business models and network architecture can achieve the best trade off?

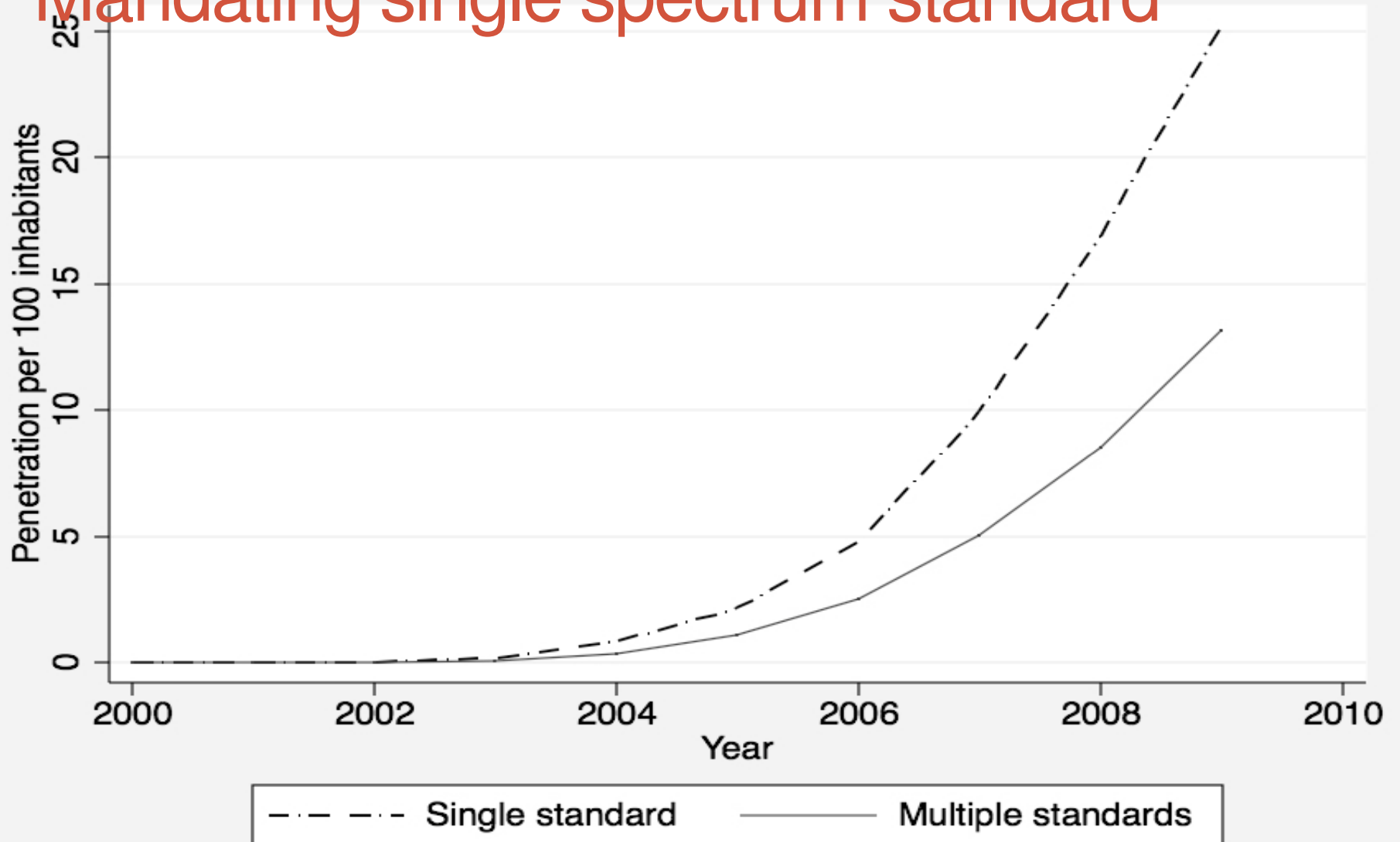
What are the best spectrum management practices?

- Spectrum Management policies critical to diffusion
 - ✓ The decisions on technology standards
 - ✓ the choice of spectrum band
 - ✓ the method to award licenses
- Simple: Correct policies can increase the speed of diffusion whereas flawed policies can hinder growth

Does mandating a single technology standard help?

- Converge to single standard (LTE advanced)?
- ✓ Avoid inertia while consumers wait to see which technology will dominate
- ✓ Global roaming
- Cons
- ✓ Avoid premature adoption of inferior technology
- ✓ Technological competition can lead to lower price and innovation

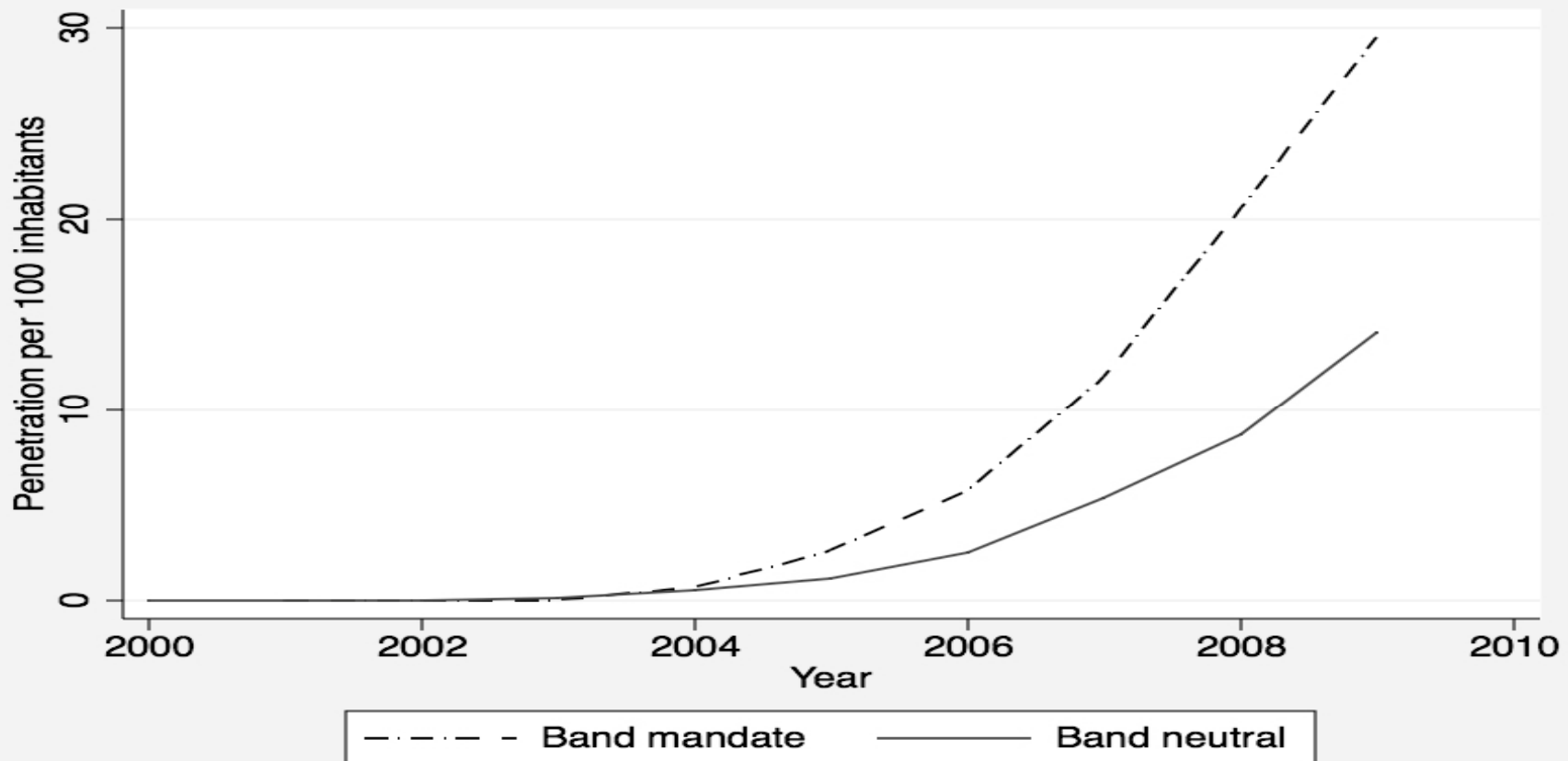
Mandating single spectrum standard




Mandating Specific Spectrum Band

- Mandating
 - ✓ forces the operators to go through the spectrum award process to introduce new technology
 - ✓ might be capable of reusing their existing spectrum
- Not mandating
 - ✓ allow spectrum holders to optimise spectrum usage by refarming certain portions of the 900/1800 MHz for more efficient 3G/4G services

Mandating Specific Spectrum Band



Limiting 3G to a single frequency band promotes faster roll out (approx 7 to 8 months) , but in the long run can slow down the growth

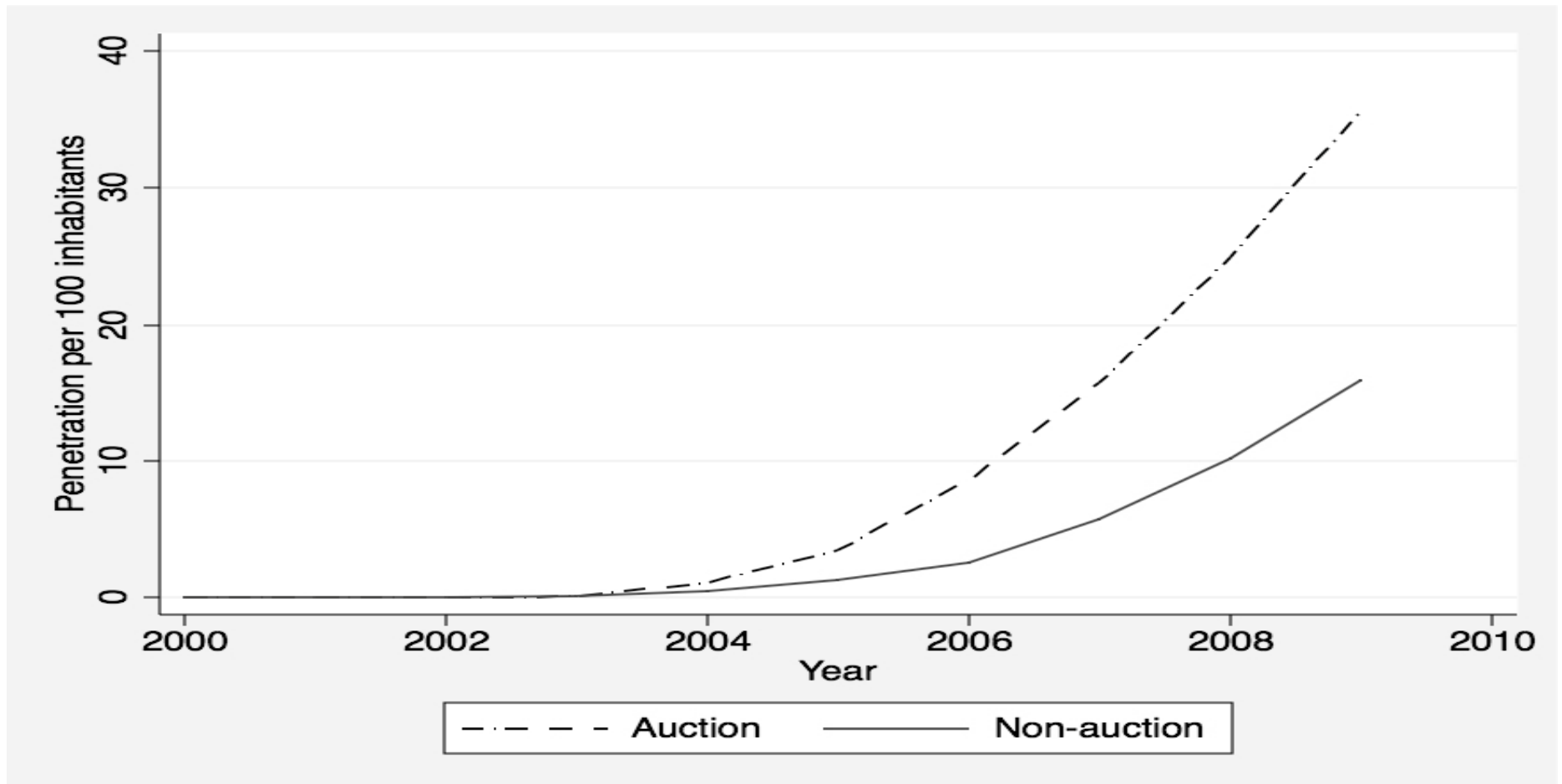


What do empirical results tell us about the award process and diffusion?

Auctions and Diffusion

- Park, Lee, Choi (2011, Information Economics and Policy)
- Test for potential problems that auctions may cause
 - ✓ high licensing fees
 - ✓ high consumer prices
 - ✓ lower incentive to invest in infrastructure
 - ✓ concerns about market concentration
- Despite the higher average fees for the auctioned spectrum, there is no evidence that auctions have led to an increase in consumer prices

Average 3G per 100 pop world wide (auction vs. non auction)



Development of Secondary markets

- Policy should recognize critical nature of secondary markets in maintaining efficient spectrum and wireless markets
- ✓ Spectrum sharing, MVNOs, real time spectrum auctions
- ✓ mesh networks; location technologies and spectrum sensors do allow various forms of spectral sharing
- Secondary market could emerge and reinforce the efficiencies created through the auctions
- Time to move away fro “Mother May I” approach to spectrum usage

Further questions..

- How much new spectrum is to be allocated
- **more significantly**, Who gets it? Quality vs. Competition trade off
- Any gains from dividing spectrum into smaller parts in an effort to create more firms (e.g., using spectrum caps)?
- Recognise valuable roles for both licensed and unlicensed spectrum in overall spectrum policy
- ✓ Unlicensed spectrum encourages innovation by many parties
- ✓ Licensing or ownership discourages innovation by giving too much power to the licensee or owner

Thank you

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