

Spectrum Auctions - Lessons from North America, Europe and beyond

Tim Miller

TechUK spectrum management seminar

31 August 2016

Topics for discussion



- Spectrum Auction Design
- Cleared Spectrum and Incentive Auctions
- Approaches on Spectrum Blocks and Lots
- Regulatory Restraint or Regulatory Intervention
 - designing for competition and level playing fields
 - use it or lose it
 - coverage and other licence conditions and durations

Seminar agenda

- Keynote presentations
 - Tim Miller, Plum Consulting
 - Recent trends in auctions and spectrum values
 - Johanne Lemay, Lemay – Yates Associates Inc
 - Experience from the US auctions
 - Robert Leese, Smith Institute
 - Future trends in spectrum use and impacts on auctions

- Panel discussion
 - As above, and including:
 - Graham Louth, Aetha Consulting (formerly of Ofcom)
 - Mark Falcon, Zephyre (formerly of Three)

Are auctions always the best way to award spectrum?

Auctions have grabbed headlines ...

CNNMoney

NEWS > International

ADVERTISEMENT

German phone auction ends

August 17, 2000: 1:59 p.m. ET



UMTS mobile phone license auction raises \$46 billion; six licenses awarded

LONDON (CNNfn) - Germany's third-generation mobile phone auction finally ended Thursday, much to the relief of competing rivals, after bidding topped \$45.8 billion as Group 3G dug in its heels and refused to throw in the towel.

SAVE
EMAIL
PRINT
MOS

BBC CATEGORIES TV RADIO COMMUNICATE WHERE I LIVE INDEX SEARCH Go

BBC NEWS

You are in: Business
Friday, 26 January, 2001, 18:48 GMT

US wireless auction raises \$17bn



News Front Page
World
UK
England
N Ireland
Scotland
Wales
Politics
Business
Market Data
Your Money
E-Commerce
Economy
Companies

3G licence battles

Click here for more news and analysis

Key stories

- Spiralling costs
- Europe-wide debt woe
- Telecom debt warning
- Nervous investors
- Licence rollercoaster
- Pressures to merge
- 3G costs slashed?
- Race to be first

Consumer choice?

- Vodafone's first trial
- DoCoMo delays launch

FierceWireless

WIRELESS TECH EUROPE DEVELOPER 5G IOT

Wireless

Spectrum auction pushes past \$13B in round 10

by Colin Gibbs | Aug 23, 2016 1:36pm

... but sometimes for the wrong reasons

MOBILE WORLD LIVE LATEST APPS ASIA DEVICES MONEY

HOME

Mexico postpones spectrum auction to 2017

23 AUG 2016

1 f 1 in 5 t G+ e r +



shutterstock

Mexican regulator Federal Telecommunications Institute (IFT) said it will delay a planned spectrum auction to next year, in a bid to generate more competition.

live mint

26 August 2016 | E-Paper

Home | Companies | Indu

Financial Services | Manufacturing | Retail | Telecom | Infotech

2G AUCTION SPECTRUM SISTEMA SHYAM SSTL DOT

2G spectrum auction fails before it begins

Only one telecom firm applies to participate, likely delaying sale and potentially upsetting budget calculations

THE TIMES OF INDIA

TECH

Tech Tech News Reviews Jobs Social IT services Slideshows How to Mobiles PCs Apps Gaming Computing

News Home » Tech » Tech News

Upcoming spectrum auction will be the most one-sided: Suresh Mahadevan, UBS

ET Bureau | Aug 20, 2016, 01:58 PM IST

✉ 🖨 A- A+

HOME ASIA NEWS

Jasmine fails to make payment, forcing Thai 4G re-auction

22 MAR 2016

Share Tweet

Are regulators getting it wrong?

- Auctions are theoretically efficient
 - Reveal preferences of buyers
 - Lead to efficient allocation of spectrum
 - Lead to benefits for consumers
- But ...

Regulators may have objectives other than efficiency

Obligations and restrictions on lots distort values

Sudden expansion of spectrum availability reduces criticality of any one band

Use of spectrum is changing over time

Operators are facing changes in technology and usage patterns

Trends in spectrum awards

Are regulators adapting their processes?

Licence periods are lengthening

UK now tends to award indefinite licences

EU set to mandate 25 years

Growing tendency to avoid auctions for renewals

What were expectations in 2000 for 2100 MHz?

Greater certainty for operators

Recognition that high auction prices impacts on investment

Payment terms extended or annual fees redefined

Business case for 5G already uncertain

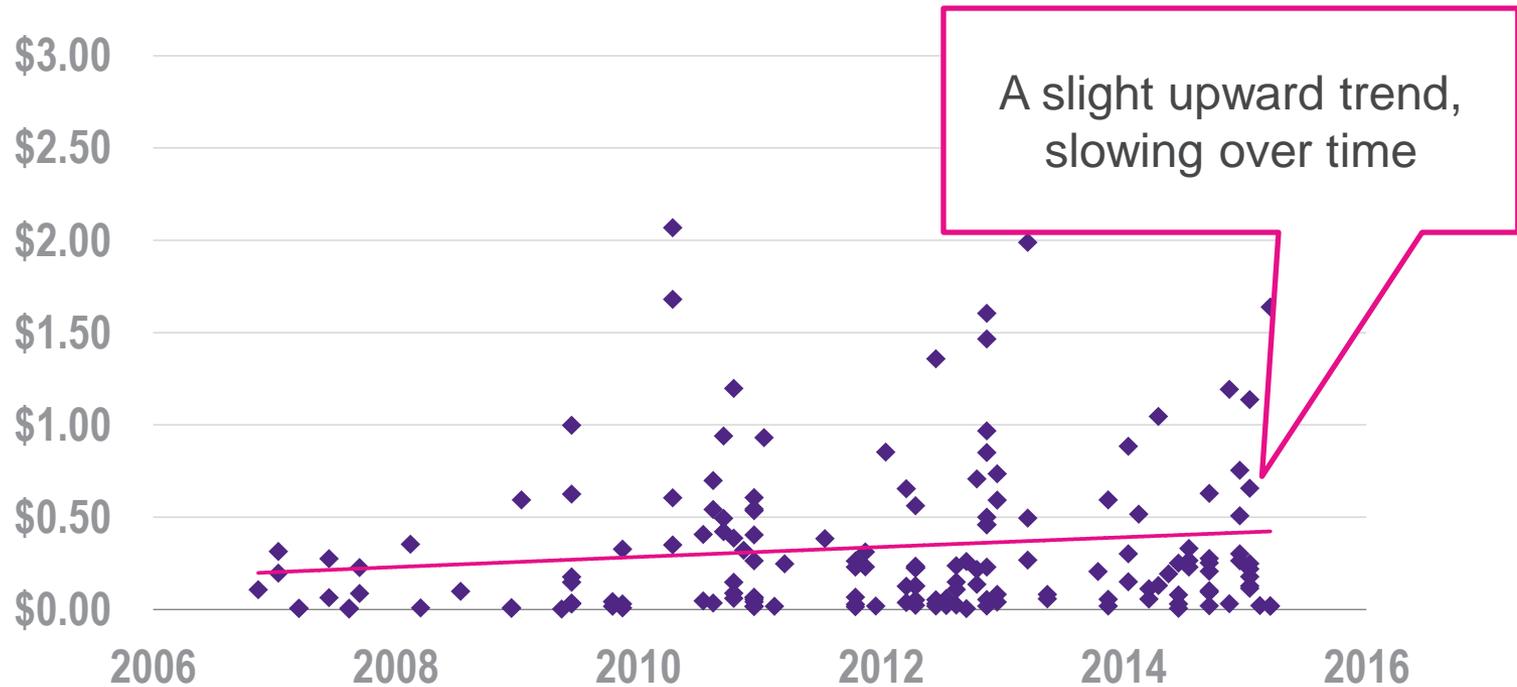
Trends in spectrum value

Is spectrum value growing?

- “Networks are expanding fast, and spectrum is more valuable than ever” – Pete Pachal, Mashable

Spectrum auction prices

USD/MHz/pop



Source: Plum Consulting

Why aren't we seeing exponential growth in value?

Market issues

- ARPU is falling – consumers may be using ever more data but they are not paying more for it
- Multiple technologies lead to the need for new base station equipment
- Small cell technologies are less reliant on particular spectrum bands
- Carrier aggregation and refarming enable better use of more spectrum
- Sharing (infrastructure and spectrum) means less need for additional spectrum

Regulatory intervention

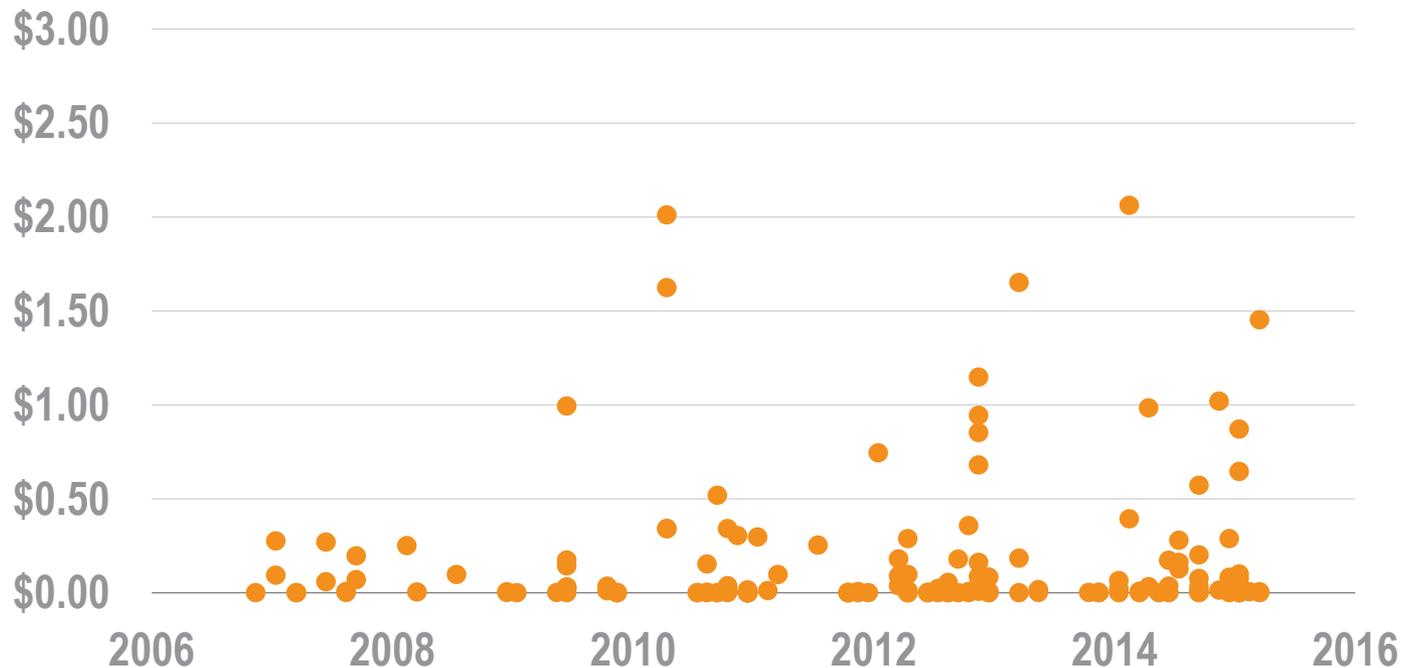
- Greater spectrum availability makes each individual band worth less
- Coverage obligations, social welfare funds, quality of service rules remove value to non-monetary instruments
- Auctions are often ill-designed and poorly run

More auctions are being sold at reserve price

- Regulators may be driven by financial motives or poor valuations
- Growing disparity between how operators and regulators value spectrum

Gap between auction and reserve prices

US\$/MHz/pop



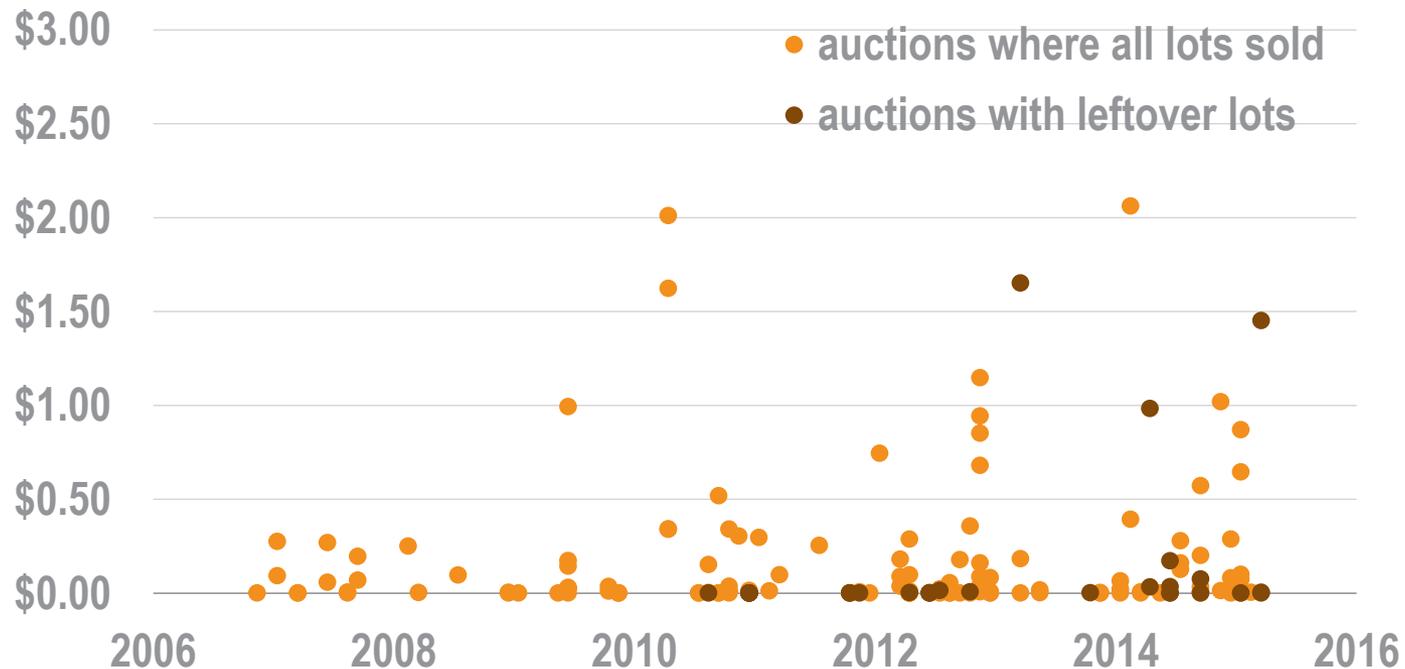
Source: Plum Consulting

More auctions are resulting in unsold lots

- Many auctions fail to sell due to overly high reserve prices
- Others fail to sell due to a lack of demand

Gap between auction and reserve prices

US\$/MHz/pop



Source: Plum Consulting

What can we learn?

Auctions that go right

US AWS-3

- Clearly defined need for spectrum
- Well-designed lots and process
- Well timed auction

German multi-band

- Simultaneous auctions enable operators to build optimum profile
- Obligations did not reduce value but encouraged competition
- Complicated auction process lead to signalling

UK 800 and 2600 MHz

- Lots designed to facilitate new entrant
- Clear differences between blocks
- Revenue lower than expected – but were expectations realistic?

Auctions that go wrong

Thailand 900 MHz

- Reserve prices set very high – one winner defaulted on payments
- Investment in networks suffering
- Reauction sold at (again very high) reserve price

Mexico AWS-1

- Spectrum sold at reserve price – set above benchmark levels
- One lot unsold despite industry need
- Operators investigating sharing and wholesale solutions

Paraguay AWS-1

- Largest operator did not take part – instead refarming existing spectrum and building more network
- High costs of obligations