

The value of 3.4–3.8GHz spectrum: care is required when analysing the prices paid in previous auctions

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The prices paid at recent auctions for spectrum in the 3.4–3.8GHz band have varied significantly. Local market characteristics and features of the award process design can help to explain some of these variations. Seven more European countries have announced intentions to award this spectrum in 2019.¹ Estimation of spectrum value in these markets can be improved by careful analysis of the results of past awards.

3.4–3.8GHz spectrum is considered to be of central importance for enabling early 5G launches in Europe

In late 2016, the European Commission² and the Radio Spectrum Policy Group (RSPG)³ identified the 3.4–3.8GHz band as the “primary band suitable for the introduction of 5G-based services in Europe even before 2020”, highlighting that this band is already harmonised for mobile use with a rapidly growing device ecosystem. The value offered by this band for meeting the growing capacity demand by mobile networks, and in particular for 5G, arises from the (so far, unique) availability of large, contiguous spectrum blocks that have the potential to deploy 5G carriers of up to 100MHz in size.

Recent technology developments (including the arrival of massive MIMO technology) have further increased the value of the 3.4–3.8GHz band.

These factors, taken together, mean that mobile operators can add unprecedented amounts of capacity to their networks through acquisition and deployment of spectrum in the 3.4–3.8GHz band. In addition to these capacity gains, using the band in a massive MIMO configuration has led to better coverage than was initially expected for deployments on existing macro cells, which is leading to a scaling back of small-cell ambitions (significantly reducing the associated costs of deployment), at least for now.

Recent prices paid for 3.4–3.8GHz spectrum have varied greatly

The 3.4–3.8GHz band remains a relatively new band for the mobile industry. It uses relatively new technologies, which means that its value is hard to estimate. This may partially explain why the prices paid at recent auctions have diverged substantially. Figure 1 shows normalised benchmarks of prices paid in recent 3.4–3.8GHz awards in Europe.⁴

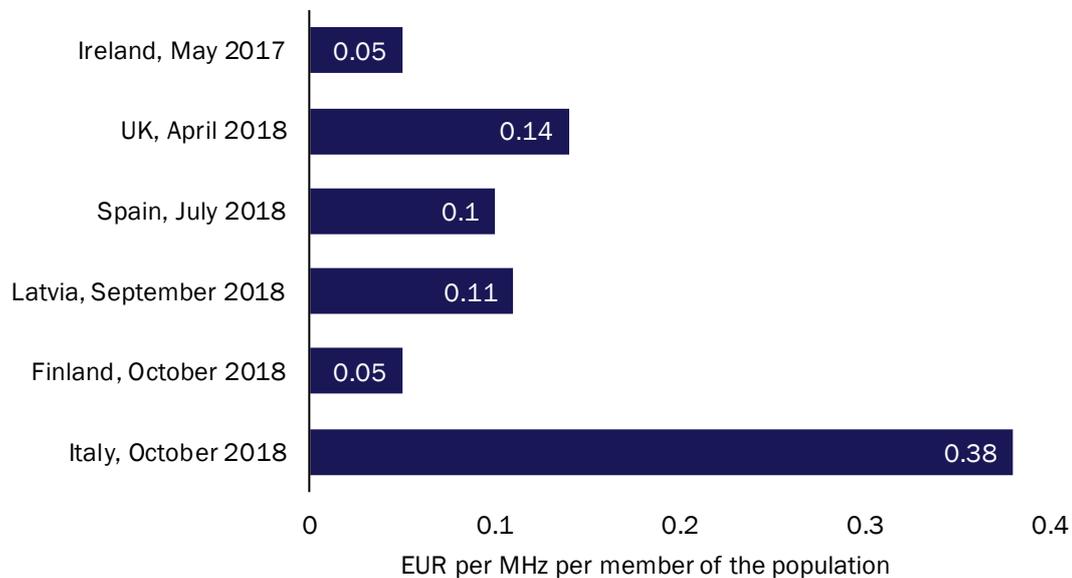
¹ Namely Austria, Belgium, France, Germany, Greece, Lithuania and Sweden.

² See the European Commission’s COM(2016) 588 final decision of 14 September 2016, available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52016DC0588&from=GA>.

³ See the European Commission’s RSPG16-032 FINAL decision of 9 November 2016, available at: http://rspg-spectrum.eu/wp-content/uploads/2013/05/RPSG16-032-Opinion_5G.pdf.

⁴ Awards have been made in Australia and South Korea; in both cases normalised prices from these awards occupy a position between the UK and Italian benchmarks.

Figure 1: Timeline of awards for 3.4–3.8GHz spectrum and EUR/MHz/pop prices paid⁵ in 2018 terms and normalised to 20-year licences [Source: Analysys Mason, 2019]



Source: Analysys Mason

The Irish auction, held in May 2017, was the first award of 3.4–3.8GHz since the band’s potential use for 5G became widely recognised. Since then, there has generally been an upward trend in prices, but this has not uniformly been the case. The most recent European auctions in Finland and in Italy (both in early October 2018) ended at very different prices.

In Finland, a total of 390MHz of 3.4–3.8GHz spectrum was made available and, with three mobile operators bidding, the award led to an even split of the spectrum into 130MHz assignments at near-reserve prices.⁶

In Italy, the dynamics of the award were very different. Only 200MHz was made available, with any future release of the band’s remaining spectrum being highly uncertain. In addition, five bidders were interested in the spectrum, leading to significant scarcity. The situation was further exacerbated by the division of the spectrum into four unequal sized blocks (two blocks of 80MHz and two of 20MHz). In order not to miss out on the ability to offer ‘full 5G’ in the future, aggressive bidding for 80MHz blocks led to high prices.

Careful analysis is required when estimating the value of spectrum in this band for upcoming auctions

The 3.4–3.8GHz offers opportunities for implementing new technologies in a new spectrum band. To prepare for awards of this spectrum band, tailored business modelling is the only truly reliable approach. Benchmarking of prices paid in previous auctions can be a useful tool, particularly as a cross-check on modelled outputs, but

⁵ Annual licence fees (ALFs), which can be substantial, have been included for the entire licence duration where information on these ALFs is publicly available (namely for awards in Ireland, Spain and Finland).

⁶ Finnish operators Telia and Elisa paid approximately 30% and 25% over reserve price, respectively, while DNA was awarded the spectrum at the reserve price.

such an exercise needs to carefully consider the individual circumstances, as well as the prices paid, in previous auctions.

For example, the prices paid in Italy's recent auction appear to have alarmed many mobile operators in other markets. In particular, these operators are concerned that the prices paid in Italy represent a benchmark of the value of the spectrum that could lead to high auction revenue expectations from other regulators and governments. Meanwhile, in Italy, some concerns have been expressed (for example, by trade unions) about whether the prices paid might threaten the viability of some operators.

But are these valid concerns? And if so, why did the Italian operators pay so much? AGCOM president Angelo Marcello Cardani was quoted by Reuters as saying that: "if someone pays a price, to me it's never excessive, unless that person has a gun pointed to their head".⁷ While true, this also appears to somewhat miss the point: auctions should ideally be designed to lead to the spectrum being assigned efficiently at the **market value** (or **market clearing price**), covering the **opportunity cost** of the use of that spectrum to the highest losing bidder. Although the winning bidders were not under any such duress (and will therefore have won the spectrum at prices below their **private values** of the spectrum), the aim of an auction should not generally be to extract most or all of this private value (to the extent that it may exceed the opportunity cost).

Whatever the objectives of the auction in Italy, it appears clear that aspects of its design led to record prices. It would have been interesting, for example, to see what would have happened if the spectrum had been packaged as five blocks of 40MHz.

We would therefore not expect to see prices in upcoming auctions as high as those paid in the Italian auction. However, prices such as those paid in Finland may understate the market value of the spectrum in markets where there is more demand than the available supply.

Analysys Mason offers services including spectrum valuation and auction support, as well as advice on business planning and spectrum management issues, to operators and regulators around the world. For more information about our services, please contact Mark Colville, Principal, at mark.colville@analysismason.com.

⁷ Source: Mobile World Live (11 October 2018), *Italian regulator defends 5G auction*. Available at: www.mobileworldlive.com/featured-content/top-three/italian-regulator-defends-5g-auction/.