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ANALYSYS MASON

QUARTERLY

Consulting and research specialists in telecoms, media and technology

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Featured in this issue

Predictions from Analysys Mason Research for the telecoms, media and digital economy markets in 2019

Fibre deployment: the planets are aligned for significant network investment

Options for telecoms regulators to encourage consumers to engage with the market

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Introduction

Welcome to the first Analysys Mason Quarterly for 2019.

We begin with predictions from Analysys Mason Research for the telecoms, media and digital economy markets, highlighting which trends will make an impact in the next 12 months.

Bram Moerman
CEO Analysys Mason

Stéphane Piot, from our Consulting Division, discusses investments in fibre networks and how the rationale behind investors' increased appetite for fibre assets raises questions. Stéphane addresses the number of interrelated and mutually reinforcing factors that can be analysed to provide an explanation.

James Allen, Head of our Regulation Consulting team, examines how operational issues affect quality of service because of the conflict between time-varying demand and a finite quantity of resources. James explains that to improve the quality of service for end-users, modelling helps us to understand the level of additional resources required.

3.4–3.8GHz spectrum is of central importance for enabling early 5G launches in Europe. Mark Colville's article highlights recent technology developments have further increased the value of the 3.4–3.8GHz band. However, careful analysis is required when estimating the value of spectrum in this band for upcoming auctions.

Competition is not working well in many markets (including telecoms) for those consumers who do not shop around regularly. Chris Nickerson's article considers how regulators could intervene to maximise the effectiveness of competition in a market and the powers telecoms national regulatory authorities (NRAs) have to intervene.

Telecoms networks are an essential component and enabler of the secure and efficient operation of critical national infrastructure (CNI) such as utility networks. Ian Adkins examines the dilemma facing utility companies about whether to rent their telecoms networks or whether to develop their own telecoms network and application services to satisfy their specialist needs.

Predictions from Analysys Mason Research for the telecoms, media and digital economy markets in 2019

Larry Goldman, Partner, Research

5G: there will be many commercial 5G launches but consumers will not notice

The lack of devices and coverage will defer the impact of 5G to 2020 at the earliest.

5G fixed-wireless services, in particular those using C-band (3.5GHz) will gain a foothold in some markets. The dominant commercial model will be from mobile challengers pitching low-cost alternatives for cord cutters rather than as full alternatives to FTTH and cable.

IoT: the market for IoT connectivity will continue to develop and new models will appear

1NCE and Twilio introduced IoT connectivity offers in 2018 and we expect ARM to introduce connectivity embedded with its processor in 2019. Others will emulate these disruptive models, threatening traditional operators' claim on connectivity.

Enterprises: operators will buy IT operations to expand portfolios and there will be many SD-WAN launches

The trend of operators buying IT operations' to expand their enterprise portfolios will spread from Australia, Europe and North America to the rest of the world. The acquisitions will be made with a view to obtaining staff – countering the more general trend of operators reducing the size of their workforce.

There will be many SD-WAN launches in 2019 but actual adoption will spread slowly because of established contracts and the conservative buying habits of enterprises – as evidenced by the slow take-up of hosted VoIP.

Small and medium-sized businesses: this market will streamline with DaaS and cloud apps

The device-as-a-service (DaaS) market will grow in popularity, particularly in the medium-sized business segment, where this business model will help IT staff to manage a large number of devices and software. Business spending on DaaS solutions will reach USD23.5 billion worldwide in 2019.

Investments in cloud-based line-of business (LoB) software will underpin the digital transformation of small and medium sized businesses (SMBs) in 2019 and beyond. Digitalising intricate vertical-specific business processes and customer experiences will be key to staying competitive for SMBs, which are expected to spend USD20 billion on LoB apps in 2019.

Homes: the battle for control of the emerging home ecosystem will intensify

Most telecoms operators do not want their home services to become Alexa accessories, but some will admit defeat in the smart home in 2019. An easier proposition for operators is to focus on improving in-home connectivity, and many home network service-level guarantees will be announced.

Increased competition in FTTx will lead fixed–mobile convergence (FMC) operators to build retail offers around connectivity. Many telcos will continue to look to video services for growth, but their offers will be increasingly curatorial and partnership-based. This shift to OTT video will drive average per-capita data consumption above 100GB per month in some markets (about 250GB per household).

Digital transformation: operators will offer mobile apps for customer care, and will push into edge computing and network slicing

Network operators' digital transformation efforts will focus on getting mobile apps that customers will really use. This will create a more digital experience, reduce the use of the 'detested' interactive voice response (IVR) technology and help operators to automate customer care.

Operators will capitalise on their investments in virtualised networks to push into edge computing and network slicing. These technologies will enable operators to exploit virtual networks to offer new types of services, including those that will be facilitated by 5G networks.

Artificial intelligence: automation will lead operators to cut jobs and MSPs will capitalise on the needs of SMBs

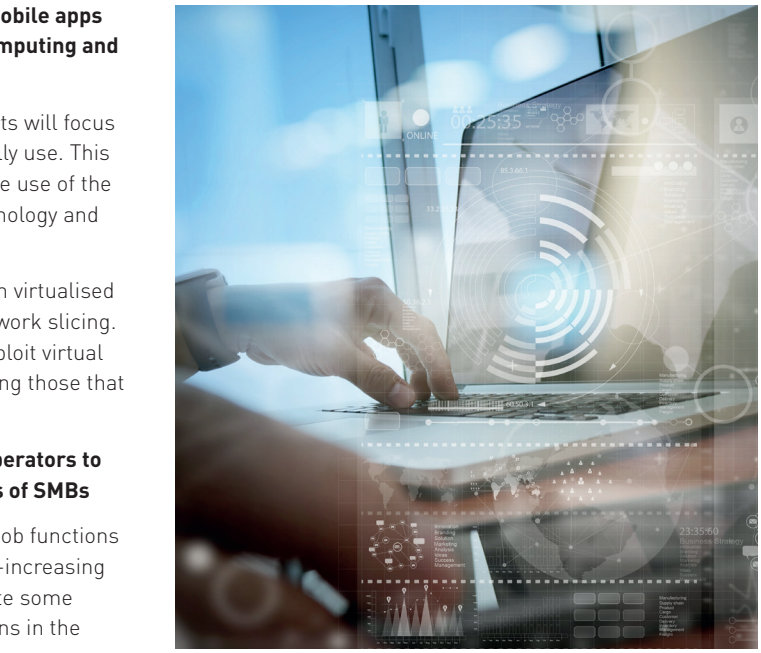
Operators will expand the scope of automated job functions by applying AI and machine learning to an ever-increasing base of data. Some operators will fully automate some network operations, which will lead to reductions in the number of staff needed to run the core network.

AI will become a more-important factor in consumers controlling their network-enabled services, but Amazon, Facebook and Google will dominate.

Managed service providers (MSPs) will use AI and machine-learning solutions to help the growing number of SMBs that are coping with a burgeoning number of devices and rising labour costs.

Investor value: business simplification initiatives will enable telecoms operators worldwide to reduce headcount

The telecoms operator industry will shed at least 5% of its workforce worldwide in 2019 despite investing in new lines of business such as enterprise services. Most of the job cuts will be due to business simplification rather than automation. Most operators have the potential to cut 25% of positions within 5 years as they simplify and start to realise the payoff of digital transformation.



Questions?
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Fibre deployment: the planets are aligned for significant network investment

Stéphane Piot, Partner, Consulting

There has been an impressive number of investments in and carve-outs of fibre networks in the last few months, including those in France (including SFR, Bouygues Telecom and public initiative networks), Italy (Metroweb/Open Fibre, KPNQwest, MC-Link and Infracom), the Nordic countries (Nianet, Tampnet and TDC), Portugal (DST), Spain and Latin America (including Adamo and Ufinet) and the UK (Cityfibre, euNetwork, GigaClear, GTT and Interoute).

Competition between potential investors is expected to be fierce given the future deals that have already been identified, as well as those deals that are currently ongoing (for example, those in Austria, France, Israel, Germany, the Netherlands, Portugal and the UK). However, the rationale behind investors' increased appetite for fibre assets, and, more importantly, the justification of the significant valuations (high EBITDA multiples) that have been reached in recent transactions raises questions.

A number of interrelated and mutually reinforcing factors can be analysed to provide an explanation. These are presented in Figure 1 and are discussed below.

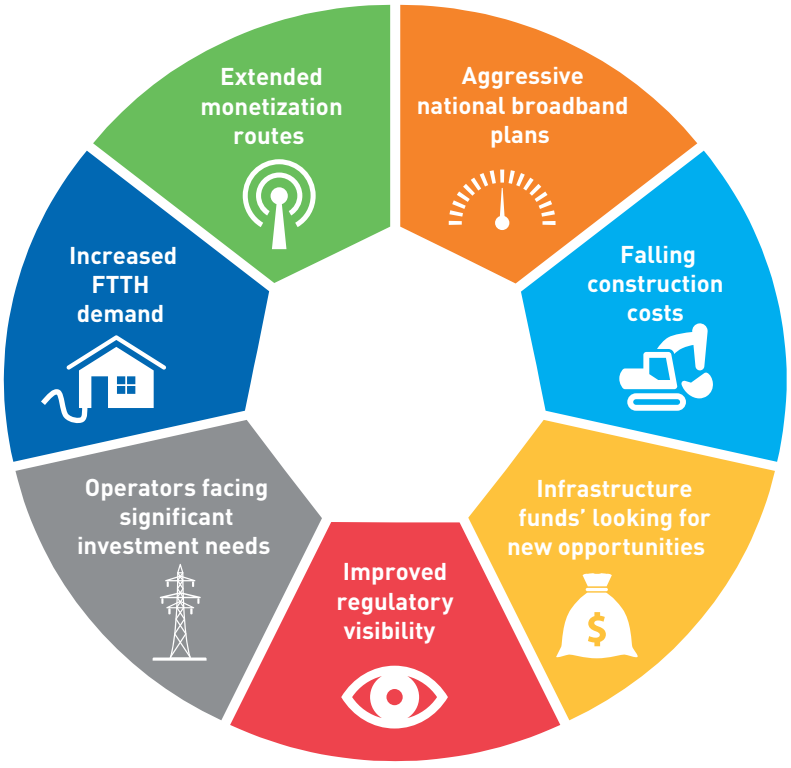

FIGURE 1: MAIN FACTORS JUSTIFYING THE APPETITE FOR FIBRE INVESTMENT AND HIGH VALUATIONS
[SOURCE: ANALYSYS MASON, 2019]

Aggressive national broadband plans

A few years ago, FTTH was seen as a complement to traditional broadband technologies (copper pair or cable technologies) that would only be deployed in very specific areas. However, numerous governments are now pushing for significantly more-aggressive, near-national fibre coverage. France was one of the first developed countries to opt for (close to) national fibre coverage a few years ago (hence the significant number of recent fibre investment projects). The UK and now Germany (among others) are pushing for extended fibre coverage, following the realisation of the need for and the interest in fibre-based broadband connections for all citizens. National schemes have been devised (some with intervention subsidies (that is, compatible state aid)), and large operators have been put under political pressure to achieve such extended coverage.

Falling construction costs

Construction costs for fibre network deployments have decreased significantly due to 'learning by doing' as well as economies of scale and a more-efficient reuse of existing infrastructure (typically ducts and poles). The benchmark deployment cost in low-density areas was estimated to exceed EUR1000 per home passed (HP) a few years ago, but benchmarks now typically range between EUR450 and EUR900 per HP, even in remote areas. OpenFiber (in Italy) and MEO (in Portugal) even report costs as low as EUR250–300 per HP (thanks to the reuse of existing infrastructure). This makes extended coverage viable and boosts return on investment.

Infrastructure funds' search for new opportunities

Infrastructure funds (or arms of insurance companies) and pension funds have money to invest. Fibre projects are attracting more bidders from a utility background (for example, those that have previously invested in motorways or power) and are looking for mid- to long-term, quasi-monopolistic investment opportunities on which they can accept lower rates of return than more-mainstream private equity funds are able to. The demand for fibre investment opportunities has increased, but the supply of such opportunities remains limited, thereby creating a competitive environment for potential bidders.

Improved regulatory visibility

The new European Electronic Communication Code (EECC) (that came into force on 20 December 2018) provides greater visibility regarding co-investment and some form of remedy exemption for wholesale-only network operators (article 80 of the EECC). In addition to this, numerous countries now have a clearer and more-stable regulatory framework regarding the treatment of fibre. This typically provides enhanced visibility of the potential risks of fibre regulation for and network overbuild. For example, in July 2018, the French regulator ARCEP published a recommendation on the consistency of FTTH network roll-outs, which creates strong operational and legal disincentives for network overbuild, pre-emption and skimming. This implies that in France, fibre network deployments in sparsely populated areas are de facto quasi-monopolistic. In the UK, Ofcom published a new regulatory approach to "supporting investment in full-fibre (that is, FTTH) broadband". Increased visibility reduces investment risks and therefore facilitates external financing.

Significant investment needs

Telecoms markets are increasingly characterised by converged networks and services (typically fixed, mobile and content services). As a result, telecoms operators must make significant investments to support both their fixed (FTTH) and mobile (5G) capabilities. For this reason, they welcome co-investors (perhaps even more than before) that are willing to finance the provision of next-generation infrastructure.

Increased FTTH demand

FTTH take-up is improving steadily (where available). There are a few examples of take-up reaching over 30% of homes passed only 1 year after network deployment. In the longer term, it is likely that copper networks will be decommissioned in locations where fibre is available. This reinforces the appetite for fibre investment.

Extended monetisation routes

There are several services that require dedicated high-bandwidth links, in addition to retail broadband connections for consumers and businesses. These include data centres, mobile base stations and small cells, and the deployment of smart city services. These opportunities increase both the number of prospective customers of fibre networks and the revenue that can be generated from fibre roll-outs, and therefore increase the value of fibre assets.

Analysys Mason is the commercial and technical advisor of choice for TMT transactions thanks to its exclusive TMT focus and the experience gained in over 300 transaction support assignments over the last 5 years. In particular, over the last 2 years, we have been involved in more than 60 fibre transactions (on both the buying and selling side) including the most-sizeable deals in Europe (Austria, the Balkans, France, Italy, the Netherlands, the Nordic countries, Poland, Spain and the UK) as well as those in Asia and Africa.

Questions?
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Understanding the cost of quality of service

James Allen, Partner, Consulting

Many operational issues affect quality of service due to the conflict between time-varying demand and a finite quantity of resources. A classical telecoms example of this balance is illustrated by the probability that you can get a connection when you dial another user during the busy hour. Operators must consider a similar situation when providing field force to respond to network faults; here, a service level agreement (SLA) such as "fix a fault by the end of the next working day after the fault report" will be met some percentage of the time over the year (for example, 85%), and this percentage will depend on the number of technicians available to fix faults. There are plenty of other examples that affect each of us every day, including the time we spend in queues in shops and the response times of web servers.

Models are needed to understand the impact of increasing the quantity of resources on whichever statistic is of interest (such as the probability of meeting the SLA). In the case of voice calls, the probability of a successful connection depends on the mean demand, the average call duration and the number of channels, and is given by a relatively simple formula. Erlang worked out the mathematics for this in 1910. This formula helps us to see how having aggregated demand and a larger pool of resources leads to improved performance (the SLA will be met a greater proportion of the time). By analogy, considering the response to faults scenario above: if travel time were not an issue, we would be encouraged to treat the field force as a single, larger pool of

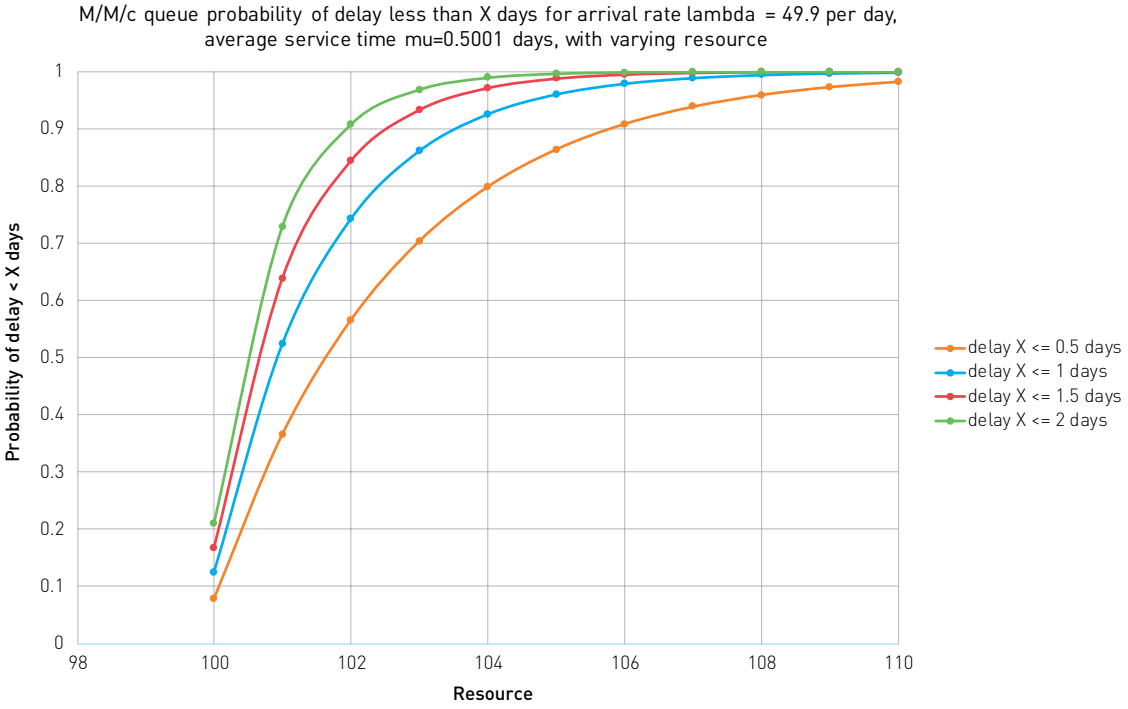

FIGURE 1: ILLUSTRATION OF THE PROBABILITY OF THE DELAY BEING LESS THAN A SPECIFIC TARGET LEVEL AS A FUNCTION OF THE NUMBER OF SERVERS, USING A STANDARD RANDOM ARRIVALS, NEGATIVE EXPONENTIAL SERVICE TIME QUEUEING MODEL ('M/M/C') (WITH THE MEAN ARRIVAL RATE λ=49.9 PER DAY AND THE AVERAGE SERVICE RATE λ=0.5001 PER DAY)
[SOURCE: ANALYSYS MASON, 2018]

resources, rather than several local teams. One additional notable point is that the formula is not easily inverted; we can easily calculate the performance of a specified set of resources, but we cannot directly determine the amount of resources needed to reach a given performance level. This means that it is more practical to calculate the performance of many different resource levels and interpolate.

If we change the assumptions, for example if the job arrivals (such as faults occurring or customers dialling) are no longer random, or if some jobs take priority over others, then even though some of these cases have known solutions that can be calculated efficiently we may need to move beyond these analytic methods and use simulations instead. Simulation allows us to go beyond the simplified cases: for example, we can add prioritisation, multiple classes of job, different types of resources, time-dependent demand, situations in which the first service attempt fails, and the effects of the working week. Such models are powerful, though they are harder to build than the analytic models (although modern tools can make this much easier). They are also harder to audit, and harder to use to generate understanding. Rare events can be particularly difficult to study, simply because they do not often occur. The volumes of data involved can be large, which makes it challenging to see patterns. Long runtimes are possible and can impede usability, even with well-chosen tools, modern computer hardware and many copies running in parallel. Specialists are required in such instances.

Analysys Mason recently performed two projects for Ofcom, looking at how the number of field force staff affected the repair and installation quality of service. In one case, we assisted Ofcom in significantly increasing the capabilities of its own model; in the other, we audited Openreach's internal model. Both models were simulations built in Python, with significant similarities, albeit taking different approaches and making different simplifying assumptions. Both could use real world data about demand. Ofcom used the results of these projects to support its estimates of the cost implications of significantly increasing the required target quality of service levels for fault repair and installations within Openreach's UK local loop network.

Questions?

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

Mark Colville, Principal, Consulting

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 Commission[2] 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.

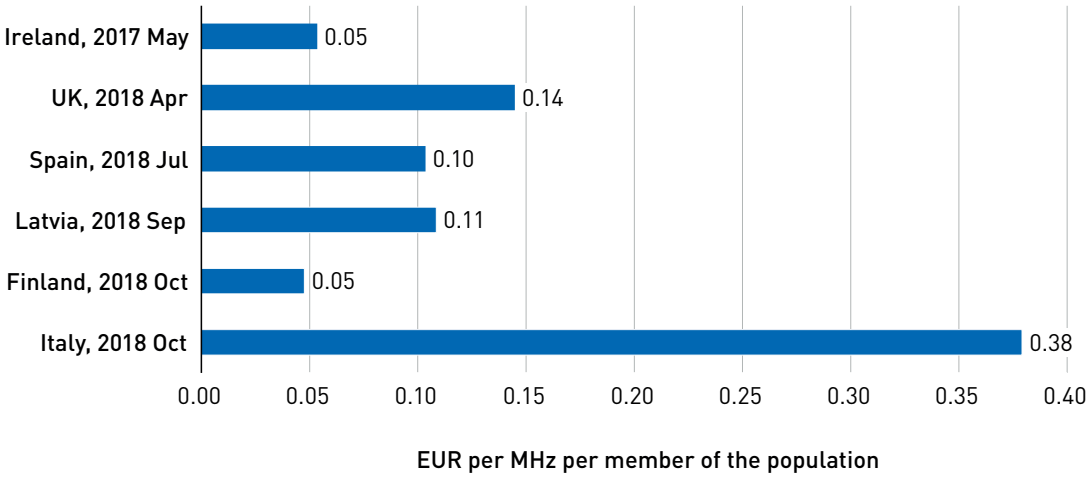

FIGURE 1: TIMELINE OF AWARDS FOR 3.4–3.8GHZ SPECTRUM AND EUR/MHZ/POP PRICES PAID[5] IN 2018 TERMS AND NORMALISED TO 20-YEAR LICENCES [SOURCE: ANALYSYS MASON, 2019]

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]

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 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.

[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.

[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.

[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/.

Questions?
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Options for telecoms regulators to encourage consumers to engage with the markets

Chris Nickerson, Consultant, Consulting

Analysys Mason has noted that competition is not working well in many markets (including telecoms) for those consumers who do not engage by shopping around regularly.[1] For the telecoms market to function, consumers must be able to compare alternative providers' products and easily switch providers.

There are merits in authorities intervening to address major consumer issues, but tackling retail procedures, terms and conditions is difficult. The relationship between consumers and suppliers is complex, and influenced by many factors, including the details of contract terms, transparency, alternative options and consumers' aversion to unexpected or unplanned charges.

Regulators could intervene in a variety of ways to maximise the effectiveness of competition in a market. But what would be a reasonable set of terms, and what powers do telecoms national regulatory authorities (NRAs) have to intervene? This article assesses the list of tools that NRAs have available to them under two headings – those that enhance the ability of customers to access information, and those that enhance their ability to switch provider.

Ability of consumers to access information

Price comparison websites

Price comparison websites for telecoms services are now common in most developed markets. However, the usefulness of these websites depends on the level of accuracy and trustworthiness of the information. To address this issue, NRAs in several countries either operate their own price comparison tool (for example, Ireland[2]) or run an accreditation scheme for commercial price comparison websites (for example, Norway[3] and the UK[4]).

Consumer awareness of usage

In order to effectively compare packages, consumers must know what usage requirements they have. NRAs may require operators to provide usage tools online (and provide usage information with billing), for example the 'good industry practice' requirements in Australia.[5]

End-of-contract notifications

Many services are offered on contracts with a fixed-term (for example, of 12, 18 or 24 months). At the end of the contract period, if the consumer does nothing, their contract may continue on a monthly rolling basis, with the consumer unaware of cheaper options (for example, SIM-only). Ofcom, the UK's NRA, recently consulted[6] on requiring providers to send an end-of-contract notification 40–70 days before the end of the contract period.

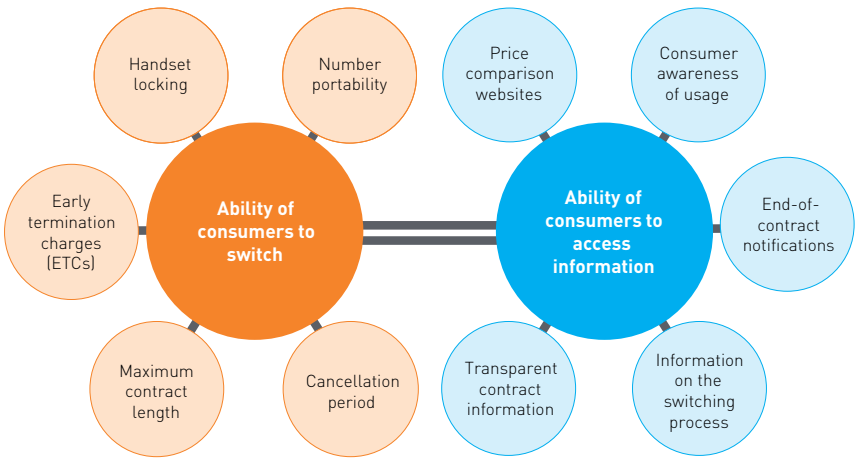


FIGURE 1: ELEMENTS THAT AFFECT CONSUMERS ABILITY TO SWITCH AND ABILITY TO ACCESS INFORMATION
[SOURCE: ANALYSYS MASON, 2019]

Information on the switching-process

A significant barrier to switching may be due to consumers perceiving it as complex or providing risks to continuing service. Most NRAs offer advice on their websites explaining how to switch providers. Obliging service providers to provide better information could also help consumers. For example, the UK recently introduced reforms[7] to its mobile switching rules, including the obligation on providers to give clear information to their customers on how the switching and number porting processes work.

Transparent contract information

Most developed countries have 'fair trading' legislation (or equivalent), which includes some form of transparency requirements, as well as a prohibition on unfair or unreasonable contract terms. EU telecoms law has additional requirements. However, NRAs must strike a balance between detailed requirements and allowing competition to flourish. For example, providers in Australia must give consumers a 'Critical Information Summary' containing key terms and conditions[8] before they agree to buy the service.

Ability of consumers to switch

Number portability

Number portability (NP) allows a consumer to keep their telephone number when switching provider. NP has been possible in developed markets for some time. However, real or perceived inefficiencies in the porting process may remain a significant barrier to switching.

The European Conference of Postal and Telecommunications Administrations (CEPT) has recommended[9] a number of best-practices for NP, including the following.

- NP should be 'recipient-led' (that is, initiated by the new provider) and as simple for the consumer as possible. A recipient-led process removes the possibility of the current provider attempting to win back custom upon a request to port.
- NP should be possible during ongoing contracts.
- Operators should meet all reasonable requests from consumers to port on a specific date.
- The porting process should be as short and efficient as possible.

In some countries (such as Austria) providers are allowed to levy a porting charge on consumers, which could be a barrier to switching. Mobile NP in most European countries is recipient-led, and in many countries (such as Norway) the porting process is completed within a day. It is possible for this to be significantly faster: porting can be completed within a few hours in Australia and Ireland.

Handset locking

Mobile devices are sometimes 'locked' to the network/provider from which they were purchased (meaning the handset will only work with that particular network/provider).

Mobile providers have different policies for unlocking phones (for example, at what point they can be unlocked without a fee). There are good commercial reasons for locking subsidised handsets, but it may be necessary for NRAs to consider unfair locking practices.

Early termination charges (ETCs)

Fixed-term contracts often specify an early termination charge (ETC) if consumers want to end the contract before completion of the full term. The approach to ETCs vary; they may depend on the amount of time left in the contract or be fixed. ETCs incentivise consumers to honour contracts, which builds medium-term certainty into network and business planning, and in some cases protects subsidised equipment charges – both legitimate commercial interests. However, there needs to be a balance between these interests, and fair and reasonable treatment of consumers.

Maximum contract length and cancellation period

Longer fixed-term contracts (for example, 24 or 36 months) can introduce inertia into a market, meaning consumers change supplier less often. In some countries, there is a maximum permissible contract length for telecoms packages (for example, a maximum of 24 months in the EU[10]).

A further consideration is cancellation periods (that is, an initial period after agreeing to a contract within which a customer can cancel without penalty). Telecoms providers in some countries are required to offer a minimum cancellation period (for example, 14 days in Ireland and the UK), which can assist consumers in the event of pressured selling circumstances.

Selecting interventions from this list is not straightforward, and requires consumer-focused, often qualitative investigations. Our regulatory expertise can assist in this area.

Analysys Mason has supported many stakeholders in assessing retail competition, and has helped with the implementation of a number of these tools.

[1] For more information, see Analysys Mason's Protecting consumers from themselves. Available at www.analysysmason.com/About-Us/News/Newsletter/protecting-consumers-from-themselves-quarterly-Oct2018..

[2] For more information, see www.comreg.ie/compare.

[3] For more information, see www.nkom.no/forbruker/prissammenlikning/veiledning-og-krav/prissammenlikning.

[4] For more information, see www.ofcom.org.uk/consultations-and-statements/category-2/price-calculator-accreditation.

[5] For more information, see www.tio.com.au/about-us/position-statements/managing-usage-and-expenditure-on-a-service.

[6] For more information, see www.ofcom.org.uk/__data/assets/pdf_file/0019/117163/Consultation-end-of-contract-notifications.pdf.

[7] For more information, see www.ofcom.org.uk/__data/assets/pdf_file/0023/108941/Consumer-switching-statement.pdf.

[8] For more information, see www.acma.gov.au/Citizen/Phones/Mobile/TCP-code/critical-information-summaries-for-telecommunications-consumers.

[9] For more information, see ECC Recommendation (12)02, Number Portability – Best Practices, approved 11 May 2012.

[10] Providers in the EU must make 12-month contracts available.

Questions? Please feel free to contact Chris Nickerson, Consultant, Consulting at chris.nickerson@analysysmason.com or Ian Streule, Partner, Consulting at ian.streule@analysysmason.com

A private mobile virtual network operator approach will offer new opportunities for utility companies

Ian Adkins, Principal, Consulting

Utility networks depend on telecoms networks, and the resilience of telecoms networks is therefore coming under the increasing scrutiny of governments, regulators and investors. In addition, utility companies are facing the dilemma of whether to rent their telecoms networks as inflexible and expensive managed services from commercial operators, or whether to develop their own telecoms network and application services to satisfy their specialist needs. The trend for many commercial enterprises is to develop more-agile strategies that use cloud and over-the-top (OTT) services and adopt an '-as-a-service' approach, but the self-provision of networks has many attractions for a utility.[1]

Analysys Mason works with utilities to develop telecoms strategies. Using mobile solutions as an example, many utilities worldwide have requirements for field engineers and fixed-location, nomadic and wide-area network monitoring devices to be served with a variety of voice, data and bespoke OTT services. A private mobile virtual network operator (P-MVNO) is an MVNO, but implements services for private enterprise use only and does not offer services to public users. A P-MVNO could provide the in-house needs of a utility. The opportunities afforded by future 5G deployment and the deeper reach of fibre that is expected from the acceleration of residential FTTB/H fibre roll-out in many countries could be catalysts for a P-MVNO approach. However, introducing and sustaining a P-MVNO model has many challenges that the utility company must overcome, across a range of technical, commercial and regulatory complexities inherent in the telecoms market. Some benefits and challenges for implementing a P-MVNO are illustrated in Figure 1, highlighting the dilemmas faced by a utility.

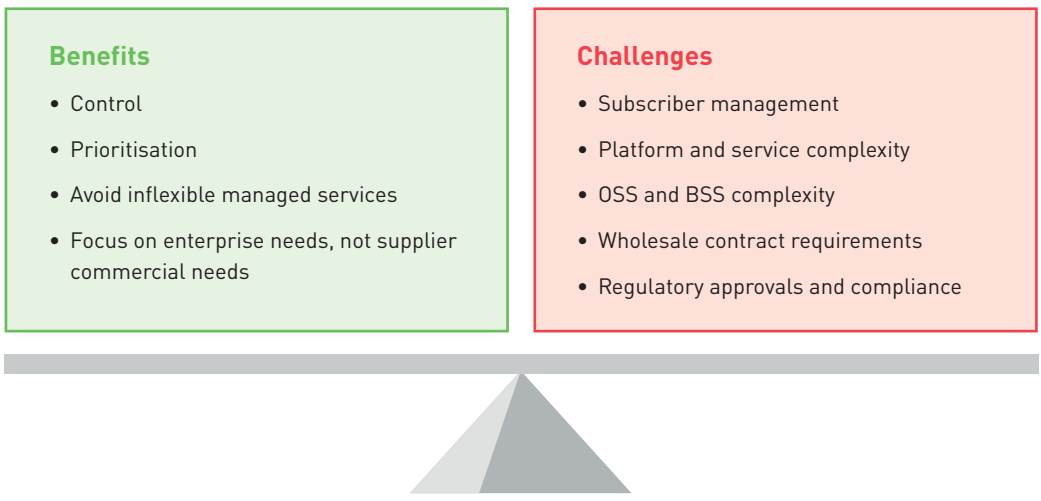


FIGURE 1: THE BENEFITS AND CHALLENGES OF IMPLEMENTING A P-MVNO
[SOURCE: ANALYSYS MASON, 2019]

Does the P-MVNO model offer real opportunities for utility companies or does it present too many challenges?

Most utility companies should consider a P-MVNO approach, in spite of the issues outlined above. In doing so, it is critical that utilities engage with both MNOs and national regulatory authorities.

Analysys Mason has the technical and market knowledge to help utility companies to assess this situation, and to prepare and present a strategic and business-oriented solution to management, internal stakeholders, vendors and host networks. Analysys Mason also has knowledge of the competitive and regulatory aspects of telecoms markets worldwide, which we can use to provide comprehensive advice.

For any organisation seeking to implement a P-MVNO, or considering any deployment of their own telecoms network, please contact Ian Adkins, for a no-obligation consultation.

[1] For more information, see Analysys Mason's research on business approaches to IoT. Available at www.analysysmason.com/services/Research/Operator-business-and-iot.

Challenge	Issues
Subscriber management	• Legacy SIMs and new devices (including eSIMs) • Number porting and forced network switching • Legacy radio devices (e.g. analogue UHF and VHF, GSM-only M2M) • Data migration
Platform and service complexity	• Internal resources (skill and capability levels) • Standards compliance • Vendor roadmaps (future services may be phased) • QoS and prioritisation on mobile operator's network
OSS and BSS complexity	• Integration of legacy and new devices • Steering of SIMs and traffic between technologies • Interface with existing systems (e.g. NOC, SCADA) as well as new systems (e.g. IoT, OTT services such as group call) • Technical and management complexity
Wholesale contract requirements	• Bespoke wholesale access terms and features • Mobile network operator (MNO) roadmaps (e.g. spectrum, coverage in key regions, specialised services) • International roaming, transit and peering • Transition from existing MNO retail services • Sophistication of MNO wholesale division
Regulatory approvals and compliance	• Satisfying 'telco' regulatory requirements, e.g. licences, numbering requirements • Data protection and handling • Provisioning and controlling devices • Security measures

FIGURE 2: THE CHALLENGES OF IMPLEMENTING A P-MVNO [SOURCE: ANALYSYS MASON, 2019]

Questions?
Please feel free to contact Ian Adkins, Principal, Consulting
at ian.adkins@analysysmason.com

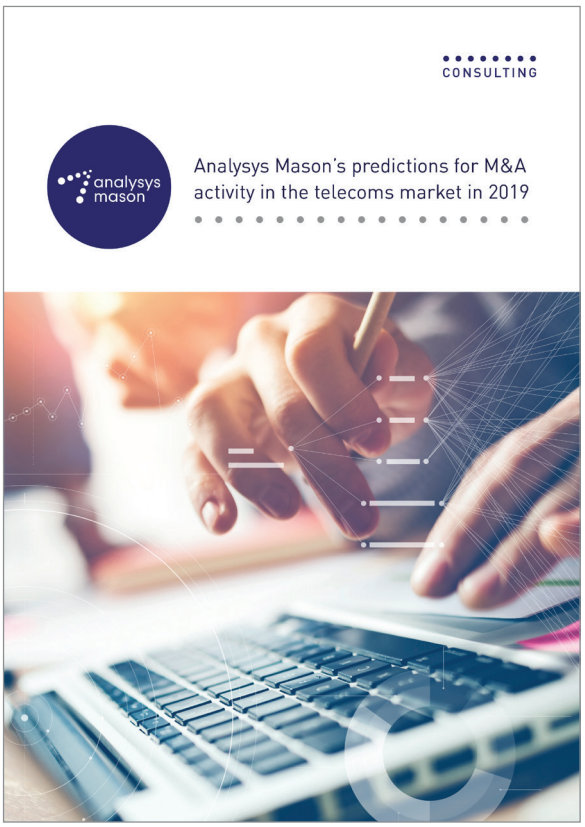
Analysys Mason's predictions for M&A activity in the telecoms market in 2019

"The telecoms sector will experience plenty of M&A activity in 2019 due to the emergence of the infrastructure wholesale business model and new technologies that will create good opportunities for investors."

For additional detail around each prediction, download our free predictions http://www.analysysmason.com/ma-predictions-2019

1. Acquisition multiples for infrastructure assets will continue to soar.
2. Infrastructure carve-outs will become more common.
3. Financiers will put pressure on European fixed incumbents to separate and to sell stakes in access networks.
4. Discussions about the benefits of creating a full-infrastructure business model will intensify.
5. The fibre deployment value chain will experience an increasing level of M&A activity.
6. Private equity firms will shop around for B2B cloud service companies.
7. Operators' M&A agendas will be dictated by the need to strengthen their enterprise and IoT capabilities.
8. 5G is coming but it will be operator-led, limiting the financial investors' M&A opportunity in 2019.
9. More IoT MVNOs will find new owners.
10. Network virtualisation/cloud native will continue to support the 'innovate-and-sell' investment thesis for challenger software providers.

Analysys Mason is the commercial and technical advisor of choice of several major financial investors and industry players thanks to our exclusive focus on telecoms, media and technology (TMT) and the experience that we have gained in over 350 transaction support assignments worldwide during the last 5 years.



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Do you have any comments on our M&A predictions for 2019?
Please get in touch with the author, Alessandro Ravagnolo, Principal, Consulting at alessandro.ravagnolo@analysysmason.com

Managed Service Provider Strategies

The role of managed service providers (MSPs) is increasing. We forecast that small and medium-sized enterprises (SMEs) will increase their spending on services offered by MSPs worldwide from USD56 billion in 2016 to USD105 billion in 2021 (13.4% CAGR).

Analysys Mason's *Managed Service Provider Strategies* research programme is designed to help:

- **MSPs** (we define MSPs as companies that generate at least 40% of their revenue from managed services, such as storage, security, networking, PBX and servers)
- telecoms operators that sell managed IT services
- suppliers to MSPs (including telecoms operators, software vendors and distributors).

Key themes

- Provides detailed market forecasts for spending with MSPs.
- Helps MSPs and their competitors to understand best practice and trends in portfolio design, supporting tools and go-to-market approaches.
- Enables MSPs to benchmark their performance.
- Helps suppliers to MSPs make the most effective use of this channel.
- All our research is supported by a survey of almost 950 MSPs. We believe that this is the largest primary research survey of MSPs.

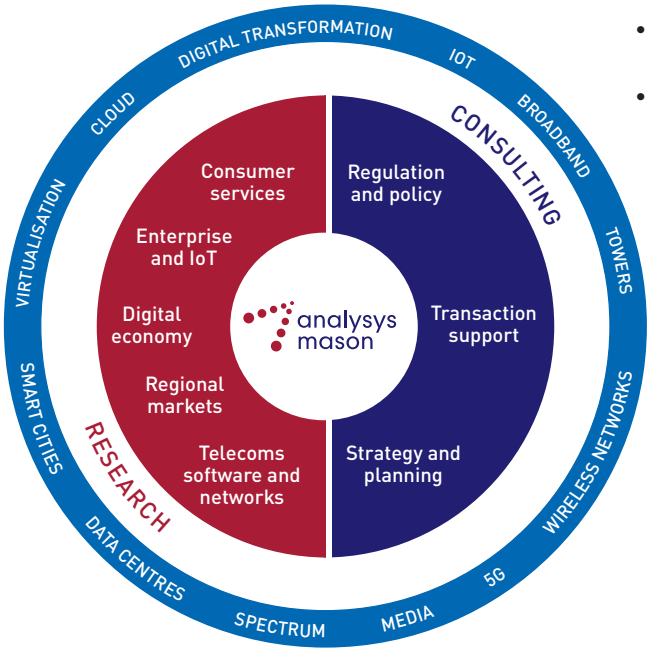
DOWNLOAD - http://www.analysysmason.com/msp-strategies

Do you have any comments or questions?
Please get in touch with Tom Rebbeck, Research Director, Operator business services and IoT at tom.rebbeck@analysysmason.com

Analysys Mason's consulting and research are uniquely positioned

Analysys Mason is the global specialist adviser on telecoms, media and technology (TMT). Since 1985, Analysys Mason has played an influential role in key industry milestones and helping clients through major shifts in the market. We continue to be at the forefront of developments in the digital economy and are advising clients on new business strategies to address disruptive technologies.

See what clients have to say about working with us: www.analysysmason.com/client-testimonials



About our services

At Analysys Mason, we understand that clients in the TMT industry operate in dynamic markets where change is constant. Our consulting and research has helped shape clients' understanding of the future so they can thrive in these demanding conditions.

Consulting

- We deliver tangible benefits to clients across the telecoms industry
- Communications and digital service providers, vendors, financial and strategic investors, private equity and infrastructure funds, governments, regulators, broadcasters and service and content providers
- Our sector specialists understand the distinct local challenges facing clients, in addition to the wider effects of global forces
- We are future-focused and help clients understand the challenges and opportunities new technology brings.

Research

- Our dedicated analyst team tracks and forecasts the services accessed by consumers and enterprises
- We offer detailed insight into the software, infrastructure and technology delivering those services
- Clients benefit from regular and timely intelligence, and direct access to analysts.

"Analysys Mason is the global specialist adviser on telecoms, media and technology (TMT). Since 1985, Analysys Mason has played an influential role in key industry milestones and helping clients through major shifts in the market. We continue to be at the forefront of developments in the digital economy and are advising clients on new business strategies to address disruptive technologies."

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