GETTING A FAIR SHARE

Recent trends in network sharing and the implications for merger control

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GETTING A FAIR SHARE

RECENT TRENDS IN NETWORK SHARING AND THE IMPLICATIONS FOR MERGER CONTROL

The timely deployment of next generation (5G) networks is a core part of the EU's digital transformation strategy. The pandemic has also exposed the importance of world class digital infrastructure and looks likely to foster greater reliance on reliable high-speed connectivity in the longer-term, due to a shift towards more remote working.

Mobile network operators across Europe are participating in the auctions for 5G spectrum frequencies, which are a precondition for deploying new generation mobile networks. However, the extent and speed of 5G roll-out will depend on access to suitable infrastructure (e.g. towers) nationwide. Increasingly, individual operators have struggled to meet the growing demand for universal coverage using their own assets. As a result, they have sought to combine infrastructure, either through mergers or network-sharing agreements (NSAs).

Competition authorities have often taken the view that many of the efficiencies associated with mobile mergers could be achieved through NSAs, with less impact on competition. This has led them to conclude that such efficiencies are not 'merger-specific' and therefore not relevant for their competition assessment.

In this briefing, we discuss the extent to which NSAs offer comparable efficiency gains to full mergers, and therefore whether they are a credible basis for ignoring key network efficiencies when scrutinising mergers. We find that:

- Challenging market conditions together with the substantial investment costs involved mean that there is a risk of operators opting for a 'watered down' version of 5G if significant cost savings cannot be found.
- Whilst NSAs have the potential to deliver similar cost savings to a merger, NSAs can take a wide variety of forms and the efficiencies achieved will depend on how broad in scope they are (both geographically and in terms of the network assets included).
- Commercial issues and competition concerns can constrain the scope of NSAs, meaning that, in practice, the efficiencies will most likely fall short of what could be achieved from a merger.

EXEC SUMMARY

In this briefing, we discuss the extent to which network-sharing agreements offer comparable efficiency gains to full mobile mergers, in light of the recent industry and regulatory trends, and consider potential implications for competition authorities when scrutinising mergers.

- It is important that competition authorities consider these potential constraints on the scope of NSAs when assessing whether they might be able to deliver similar benefits to a merger, particularly within the context of the transition to 5G, where smaller players may lack the necessary scale to make 'full 5G' viable on a standalone basis.
- This view is supported by the judgment from the European General Court's (EGC) recent reversal of the blocking of the O2/Hutchison merger, which indicates that the European Commission (EC) should put more weight on efficiencies in future merger assessments.

THE BENEFITS AND CHALLENGES OF 5G

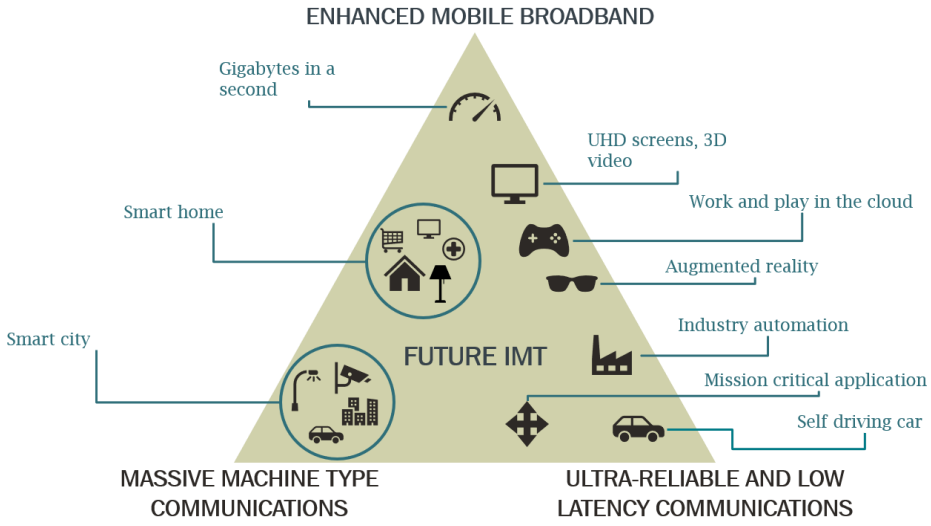
FOR MNOS, 5G IS A SIGNIFICANT TECHNOLOGICAL STEP-UP

5G is intended to be a transformative technology, delivering a far wider range of applications than current mobile networks. The applications are split into three main groups:

- Enhanced mobile broadband (eMBB);
- Massive machine-type communications (mMTC) and Internet of Things (IoT); and
- Ultra-reliable low latency communications services (URLLC) for industrial uses and virtual/augmented reality.

The use cases in each category can be illustrated by a '5G pyramid', depicted in the figure below.

FIGURE 1 PROPOSED 5G USE CASES



Source: Frontier Economics, based on ITU

Increasing the use cases that can be supported by mobile networks should in theory bring economic and commercial benefits due to economies of scope (with a single network serving a number of uses) and scale (moving to a single technology standard globally means more equipment will be needed, reducing unit costs). As such, 5G aims not only to improve the quality and lower the unit cost of existing services, but also to allow mobile networks to offer more applications.

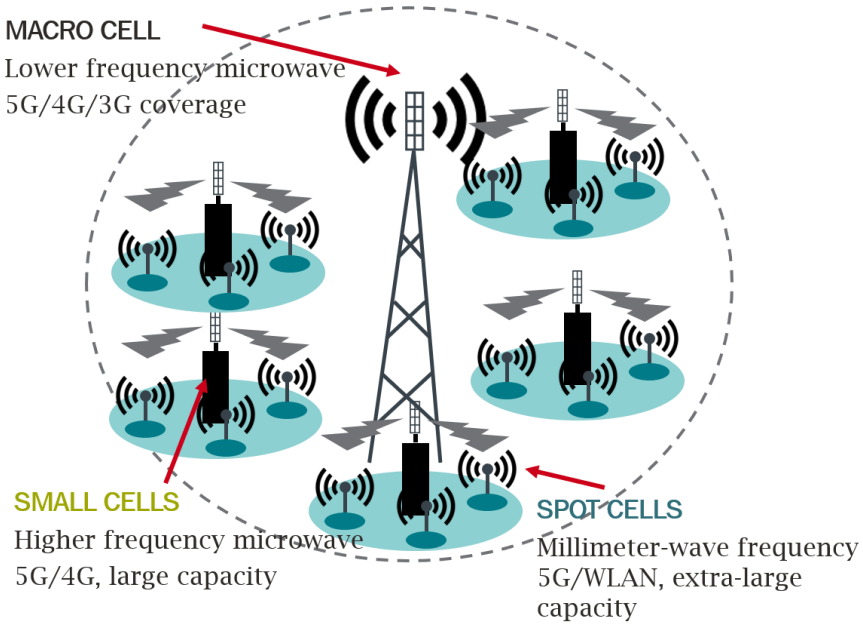
DEPLOYING 5G POSES CHALLENGES IN BOTH TOWN AND COUNTRY

In order to meet the range of 5G requirements, spectrum is needed across different frequency bands. Large spectrum blocks will need to be allocated to each network in order to provide the data throughput required for 5G.

Given the wide range of spectrum that will be deployed, including much higher frequencies than those used in previous generations, 5G is likely to be delivered through a combination of different cells, as shown in the figure below:

- Macro cells – which will provide 5G coverage alongside previous technologies relying on low frequency spectrum (mainly sub-3GHz);
- Small cells – which will sit within the cell radii of macro cells and offer additional capacity through higher frequency spectrum (3-6GHz); and
- Spot/Pico cells – which will provide extra large capacity in high traffic areas based on mmWave spectrum (24-100GHz).

FIGURE 2 5G NETWORK CELL TYPES



Source: Frontier Economics, based on ITU

MNOs may be able to roll out 5G on a partial 'best effort' basis by deploying new spectrum and equipment on existing cell sites. However, if 5G is to fulfil its potential, every site will require large investments in equipment and there will be an additional need for small cells to densify the network in high traffic areas. Analysis of the costs of 5G deployment, that Frontier conducted on behalf of DCMS[1], indicates that rolling out a small cell network across the UK could cost up £4.9 billion, whilst upgrading existing macro sites to

[1] Frontier Economics (2018) : UK Mobile Market Dynamics, A report for DCMS https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/728816/Frontier_report_on_Mobile_Market_Dynamics.pdf

5G could cost each operator around £1.1 billion. At the same time, challenging market conditions mean that operators are likely to be cautious about significantly expanding their cost base – operator returns are low and previous waves of investment have not translated to a sustained boost in profits.[2] As such, there is a risk that operators will opt for a 'watered down' version of 5G if cost savings cannot be found.

ECONOMIES OF SCALE VERSUS LEGAL BARRIERS

MOBILE CONSOLIDATION BRINGS SCALE, BUT MERGER CONTROL MAY GET IN THE WAY

Given the significant investments required, operators may struggle to build a compelling business case for rolling out 'full 5G' on a standalone basis. Mergers are one approach to gaining the necessary scale. Indeed, merging parties have commonly cited the unlocking of scale economies and the associated boost in returns from network investments as key drivers of merger efficiencies.

However, even with this 'efficiency defence', merger control may be a major barrier. Out of the eight 4-to-3 mobile mergers that the EC has reviewed since 2012, it has cleared only one unconditionally (in the Netherlands in 2018). Of the remainder, one was blocked (O2/Three in the UK in 2016), one was withdrawn by the merging parties (Telenor/Telia Sonera in Denmark in 2015) while the others were cleared subject to significant remedies, typically involving the divestment of substantial assets and/or commitments to provide network access to other operators.

It is also worth noting that, where mergers have been cleared, efficiencies have not been a contributing factor to the EC's decision. In all of the above cases, the EC has taken a dim view of potential efficiencies, with most of them failing to pass its strict 'three criteria test':

1 **Verifiability:** the EC has generally found the efficiencies claimed by notifying parties to be overstated or lacking a sufficiently robust evidential basis and hence not 'verifiable'.

2 **Merger specificity:** many efficiencies submitted have also been found not to be merger-specific – in particular, the EC has consistently argued that NSAs are a realistic, attainable and less anti-competitive means of achieving network efficiencies (e.g. by lowering investment costs).

3 **Benefit to consumers:** the EC has emphasised that it would expect only variable cost savings, and not fixed cost savings, to be passed on directly to consumers. In that regard, it has typically found that the bulk of claimed savings are fixed in nature and so would not lead directly to lower prices for consumers.

COMPETITION AUTHORITIES SEE MATERIAL EFFICIENCIES IN NETWORK SHARING

Network sharing is an alternative way of achieving the scale required to justify major investments in new infrastructure. Indeed, Article 101.3 of the EU Treaty recognises that the efficiency benefits of co-operative agreements between firms may be sufficient to offset the potential reduction in competition.

[2] For example, Vodafone Group's 2019/20 return on capital employed was 6.1%. By comparison, a 20% hurdle rate is a common level used for prospective investment projects with a degree of risk involved (see *Enders Analysis 2020, Back in play -Merger prospects in UK mobile resurrected*)

Tellingly, Competition Commissioner Margrethe Vestager noted recently: "*Operators sharing networks generally benefits consumers in terms of faster roll out, cost savings and coverage in rural areas.*"[3]

It is this possibility of network sharing as an alternative that has led the Commission to be so strict on the "merger specificity" of potential network related synergies from mergers. For example, in its 2016 decision relating to the proposed Hutchison 3G Italy/WIND tie-up, the EC noted that '*network sharing agreements are realistic and established alternatives*' and that '*active sharing agreements would bring substantial cost reduction and revenue synergies*'.[4] It therefore concluded that the claimed benefits from the deal were not merger-specific.

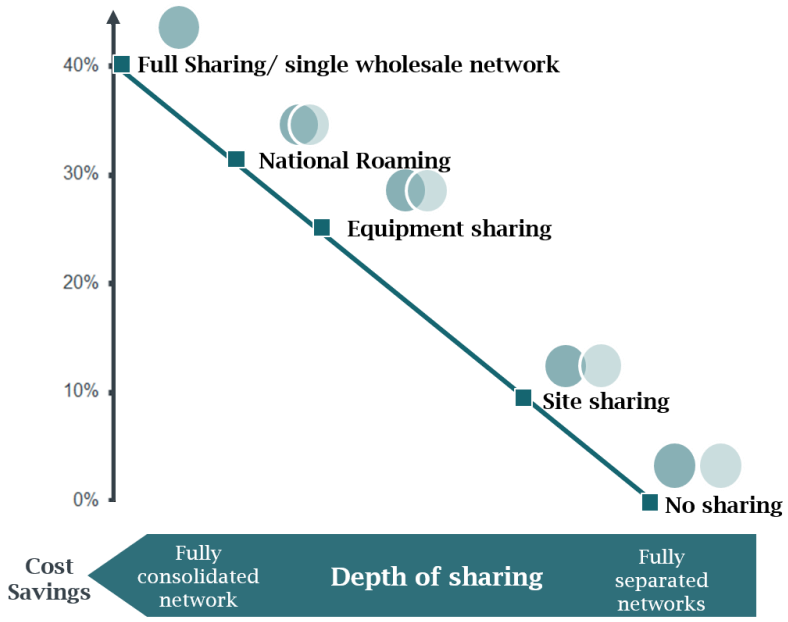
In light of these views, the possibility of network sharing as an alternative to mergers could act as a barrier to achieving scale through consolidation.

SCOPE AND DEPTH OF SHARING AGREEMENTS IS DECISIVE

In practice, network sharing can take a variety of forms, ranging from the passive sharing of on-site infrastructure, including towers and masts, through the active sharing of on-site radio equipment to, in the extreme, the development of a single/shared network, where all network elements as well as spectrum are shared.

The extent of potential cost savings (efficiencies) increases with the depth of sharing, as illustrated by the chart below.

FIGURE 3 RELATIONSHIP BETWEEN DEPTH OF SHARING AND COST OF SAVINGS IN NSA



Source: Frontier Economics

[3] https://ec.europa.eu/commission/presscorner/detail/en/IP_19_5110

[4] The European Commission (2016), CASE M.7758-HUTCHISON 3G ITALY/ WIND / JV, para. 1630

In the context of merger control, network sharing is thus viewed as an alternative way of achieving some of the efficiencies of a mobile merger, in particular:

- **Economies of scale** - sharing infrastructure means the costs of deployment can be spread over a wider customer base. This can in turn improve the business case for network enhancements and may unlock investments that would not be profitable on a standalone basis, such as network upgrades, investment in capacity and/or coverage expansion to more remote areas.[5]
- **Network densification** - to increase capacity where access to sites is constrained. Difficulties in acquiring suitable sites for a Radio Access Network (RAN) can act as a significant barrier to network densification. Operators can overcome this through either passive NSAs (installing their own radio equipment on existing sites) or active agreements (transmitting on their own spectrum on shared equipment at a single site).
- **More efficient use of spectrum** - pooling the spectrum of multiple operators on a single RAN can further reduce deployment costs[6], while carrier aggregation can allow operators to achieve higher bandwidths than is possible when each carrier uses its spectrum independently[7]. NSA parties can further reduce the proportion of spectrum used to support legacy applications (e.g. 2G and 3G services) as only a single carrier is needed for the task.

In principle, then, network sharing may generate efficiency savings comparable to those of a merger. However, whether they are likely to be achieved in practice will be linked to i) how closely the parties are commercially aligned; and ii) whether competition concerns could limit the scope of the NSA. We discuss these in turn.

LIMITS TO NETWORK-SHARING BENEFITS

COMMERCIAL ISSUES MAY RESTRICT THE SCOPE OF NSAS

In negotiating any NSA, issues that need to be resolved include how to share costs and risks, the ability of parties to act independently and the extent to which future technologies fall within the scope of the agreement and on what terms. Many NSAs would have long durations, as the lifetime of many network assets shared can be considerable (e.g. sites and related supporting equipment), therefore it is critical for the MNOs to take a longer term view when designing the NSA agreements.

In the longer run, the parties will need to see eye to eye on matters such as network upgrades on existing sites, the location of new sites and the adoption of new technical standards. As such, NSAs are likely to be most successful when the parties are reasonably closely matched in key areas, including: current market

[5] The EC has consistently argued that similar network cost savings could be achieved through network sharing – for example, in the 2016 Wind/H3G case in Italy the EC argued that LTE active sharing agreements would bring substantial cost reduction and revenue synergies and considered that, absent the merger, the notifying parties would therefore have strong incentives to enter into such agreements.

[6] We note that some regulators explicitly allow spectrum pooling, while others apply some limits. We also note that the benefits of de-duplication of network assets through spectrum pooling may be restricted due to power limits, i.e. how much spectrum can be realistically deployed on a single site.

[7] For instance, the EC decision in the O2/Hutchison states: "*a spectrum sharing arrangement would, in the Commission's view, allow the Parties to achieve virtually the same network benefits as the network efficiencies which, according to the Notifying Party, would arise from the Transaction*"; para 2473.

and financial position, spectrum holdings and network investment strategies[8]. This is illustrated by the recent failed attempt between Orange and Free Mobile in France to strike a 5G sharing agreement – Orange and Free Mobile held discussions with a view to reaching an NSA following the French 5G auction in October 2020 but recently announced that negotiations had broken off, with Orange citing a "*divergence in deployment strategy.*"[9]

The need for alignment may lead operators to limit the scope of the NSA to certain geographical parts of the network and certain functions where their interests are clearly aligned and they stand to reap significant gains, including over the longer periods of time.

Even if the initial conditions are favourable, experience shows that remaining on mutually beneficial terms over the long term is tough, for a number of reasons:

- Changes in market positioning and/or network deployment strategy;
- Changes in ownership and/or financial circumstances; and
- The emergence of asymmetries in spectrum holdings (e.g. as a result of a merger or following a spectrum auction).

Below, we illustrate the problems that can arise by summarising how the NSA between Swedish MNOs unfolded over time.

CASE STUDY

NETWORK SHARING IN SWEDEN

In 2001, the Swedish mobile incumbent TeliaSonera (Telia) partnered with Tele2 (the second player) to build a common 3G network, using Tele2's spectrum as Telia had not acquired any 3G spectrum at the December 2000 3G auction.

Around the same time, two other Swedish MNOs, Three and Telenor, also joined up to roll out 3G under the joint venture '3GIS'. As the two smallest operators in the market, with no other potential partners, Three and Telenor were relatively closely aligned.

Key drivers behind operators' incentives to strike NSAs for 3G appear to have been:[10]

- The need to fulfil the coverage requirements stated in the 3G licences in Sweden, which would likely not have been feasible without sharing.
- For the largest operator Telia, network sharing was the only way to enter the 3G business since they did not get any 3G licence.

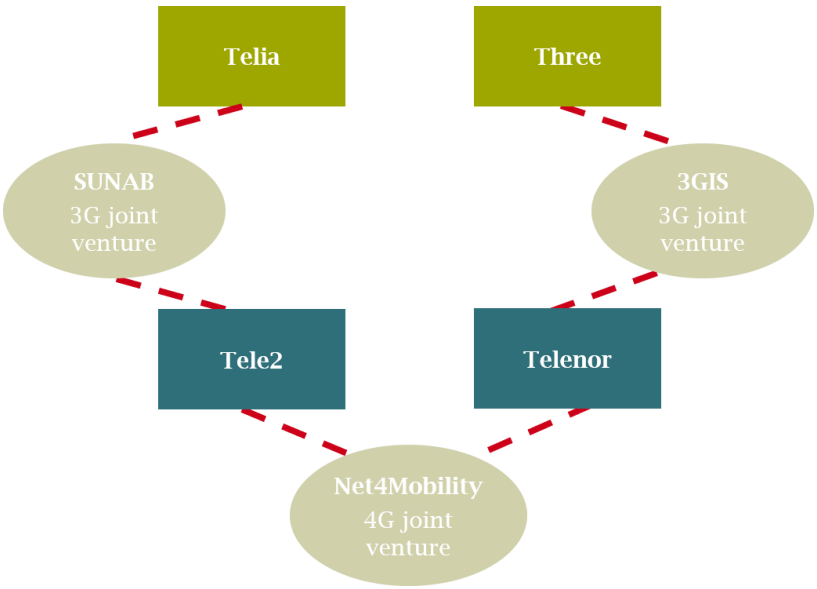
[8] In particular, the extent to which network quality/being the first to roll out new technologies is a priority for the parties.

[9] https://www.orange.com/en/newsroom/press-releases/2021/orange-ends-discussions-mobile-network-sharing-agreement-free

[10] Markendahl, Jan, Amirhossein Ghanbari, and Bengt G. Mölleryd. "Network Cooperation Between Mobile Operators - Why and How Competitors Cooperate?." IMP conf, Atlanta. 2013.

The transition to 4G, starting in 2009, saw a shift in operators' incentives which in turn led to a realignment of the sharing partners – in particular, Telia had acquired a 4G spectrum licence and decided to roll out alone as the largest and incumbent operator. Of the remaining operators, Tele2 and Telenor were then more closely aligned (in terms of businesses) and formed a 4G joint venture, 'Net4Mobility', while Three was left without a partner. Net4Mobility competed for and won 4G spectrum, and also received spectrum from its two partners. In 2019, the agreement was being revised to include 5G.[11]

FIGURE 4 NETWORK SHARING ARRANGEMENTS IN SWEDEN



Source: Frontier Economics based on Markendahl, Ghanbari and Mölleryd (2013)

This realignment of network sharing partners (see the diagram above) further illustrates the reversibility of the network sharing deals, the fact that NSAs are sensitive to changes in operators' incentives over time and that these can change over relatively short time periods.

NSAS UNDER THE COMPETITION MICROSCOPE

While network sharing is generally deemed to be a less anti-competitive alternative to mergers, they have nonetheless come under regulatory scrutiny on the basis that they can undermine infrastructure competition and may facilitate co-ordination. NSAs require complex governance structures to ensure that the parties continue to compete on price and quality as before and that there is no risk of increased co-ordination.

Even with such structures, recent cases in the Czech Republic and Belgium could indicate a trend towards a more interventionist stance by Europe's competition authorities in regard to network sharing. These cases are ongoing and it is difficult to anticipate the outcomes, as publicly available information on the areas of

[11] Bourreau et al, 2020, Implementing co-investment and network sharing (CERRE), page 73

focus is limited. However, a recent news release from the EC, relating to its decision to clear a tower-sharing joint venture in Italy (between Telecom Italia and Vodafone) sheds some light on what form of sharing it considers acceptable.[12]

In particular, the EC said that the parties' decision to scale back their active sharing, "leaving out the most densely and highly populated cities and centres of economic importance, corresponding to over 30% of the Italian population and more than 33% of data traffic" seemed "prima facie appropriate to alleviate possible concerns". The Commission also noted that, with five operators, the mobile market is less concentrated in Italy than in other member states.

That said, there are still no hard and fast rules on what is and is not acceptable. The EC stresses that it will assess NSAs on a "case-by-case basis", taking into account, among other things, "the extent of sharing, the content of contractual arrangements as well as […] the specific market circumstances". Uncertainty around what will pass muster could act as a barrier to network sharing, particularly if authorities seek to block agreements or impose strict remedies; it could also discourage parties from doing deals in the first place. In turn, this may further limit the extent to which NSAs can replicate the efficiencies of a merger.[13]

MEASURING MERGER EFFICIENCIES

MERGERS OFFER GREATER SAVINGS THAN NETWORK SHARING

NSAs have the potential to unlock significant economies of scale and network efficiencies. But these still fall short of the longer-term gains that a merger between two MNOs can achieve. This is primarily because:

- As explained above, savings from an NSA depend on the depth and scope of network sharing. A mobile merger implies maximum integration, as assets from two networks are fused together. Combining spectrum holdings makes a denser urban network and/or an extension of rural coverage possible, while eliminating network duplication cuts costs. These merger-specific benefits are over and above what can realistically be achieved through an NSA. That is especially the case if the sharing deal is restricted to non-urban areas (or only specific network technologies) to address potential regulatory/competition concerns, as was the case in Italy.
- In addition, network efficiencies from a merger are likely to last longer and extend across more investment cycles than an NSA, because the incentives of the merger parties are fully aligned. The experience from Sweden and other markets shows that even the deepest NSAs are ultimately reversible, albeit at potentially high cost to the parties. If market conditions change and, say, one of the parties gets access to more spectrum, investment incentives within the NSA may diverge. Network sharing of future technologies might be scaled back as a consequence, limiting the efficiencies achievable through the NSA. In a merged entity, by contrast, sharing is effectively impossible to unwind as there is only one network.
- Mergers are also likely to be a more viable option for asymmetric parties, where the benefits of consolidation accrue much more to one party than the other – and where it would be hard to

[12] https://ec.europa.eu/commission/presscorner/detail/en/IP_20_414

[13] Earlier this year, Orange and mobile industry group ETNO made a submission to a review of the EC's 'horizontal block exemption' regulations, arguing that RAN-sharing should be exempted from regulatory scrutiny, under certain conditions, to provide greater certainty for operators. https://ec.europa.eu/competition/consultations/2019_hbers/index_en.html and https://etno.eu/library/positionpapers/405:public-questionnaire-for-the-2019-evaluation-of-the-research-development-and-specialisation-block-exemption-regulations.html

structure an equivalent workable commercial arrangement at arms-length because of the large value-transfer involved.

It could therefore be argued that a merger between two independent MNOs will always lead to network efficiencies which are greater in the long term than those that can be achieved in practice via NSAs. This may have important implications for the deployment of investment-intensive 5G technologies, which we discus next.

ECONOMIES OF SCALE CRITICAL FOR NATIONWIDE 5G ROLL-OUT

Many more sites are likely to be needed to realise the full potential of 5G. As such, scale economies will be critical. While NSAs will likely play an important role in unlocking 5G investment, there are inherent limits to the network efficiencies they can generate relative to full mobile mergers, as explained in the previous section. Even if that were not the case, the characteristics of 5G technology could make it tough to achieve 'merger-like' economies of scale through network sharing.

Firstly, meeting different sources of demand calls for different solutions. For example, new use cases requiring very high bandwidths and/or low latency will most likely entail extensive deployment of small cells. On the other hand, additional 5G spectrum on existing macro sites could be sufficient to accommodate growth in bandwidth demand from smartphone users.

This, in turn, gives rise to a gamut of potential investment strategies, ranging from limited deployment of 5G spectrum targeted at high-demand macro sites to a 'bells and whistles' nationwide roll-out including substantial extra investment. The scope for strategies to diverge could make it harder to strike network-sharing deals.

Secondly, as explained above, full 5G rollout will probably involve establishing a lot of small cell sites, whose characteristics are quite different from those of macro cells. For a start, they occupy less space. This will likely add to the complexity of 5G NSAs. In particular, operators may seek to negotiate separate sharing deals for the two types of cells.

These factors are likely to put a further cap on the scope of network efficiencies that can be realised with NSAs. This is an important consideration that competition authorities should recognise when examining potential alternatives to mergers.

All this means that – more so than with previous generations of mobile technology – there is a risk of a two-tier structure emerging in mobile markets where only one or perhaps two larger players can afford a premium roll-out strategy of "full 5G", leaving other MNOs behind.

HUTCH/O2 RULING SHOWS MERGER EFFICIENCIES CAN'T SIMPLY BE IGNORED

In 2016, Hutchison Three and O2 attempted to merge, but the EC blocked the transaction. The two UK MNOs appealed and the European General Court (EGC) largely rejected the EC's assessment. Its landmark ruling offers insights relevant for the treatment of NSAs and network efficiencies in future mobile mergers.

In summary, the EGC judgment supports the view that NSAs are a fundamentally pro-competitive option, if designed correctly, so any theories of harm based on the argument that they restrict effective competition will need to be underpinned by robust economic evidence.[14]

Furthermore, in weighing up potential merger efficiencies, the judgment makes an explicit distinction between two types: 'standard efficiencies'[15] specific to each concentration (which should automatically be taken into account in the competition assessment) and those referred to in Section VII of the Guidelines[16] (which should be included in the assessment only if they meet the strict legal conditions of verifiability, merger specificity and benefit to consumers). It follows that for standard efficiencies the onus is on the EC to include these in its quantitative analysis. For Section VII efficiencies, the burden of proof is on the merging parties: they have to prove that the savings claimed meet the necessary cumulative conditions.[17]

The EGC's ruling could have a profound impact on how the EU evaluates future mobile mergers by introducing a more comprehensive assessment of merger-specific effects (both negative and positive) and a more detailed, evidence-based discussion of feasible alternatives, including network sharing.

CONCLUSION

It is uncontentious that network sharing has the potential to deliver significant consumer benefits, particularly in the form of a swifter, more extensive roll-out of new technologies. But the difficulty of aligning the interests of the parties to an NSA makes it hard to match the long-term efficiencies of a full mobile merger.

The transition to 5G appears to entail greater complexity when it comes to operators' roll-out strategies and decisions. This creates potential for divergence, which is likely to make the challenge of maintaining alignment even more acute.

Further, recent high-profile network-sharing investigations indicate that competition concerns may constrain the scope of potential NSAs that would be acceptable to the EC and/or regulatory authorities. This should make it more challenging for competition authorities to treat NSAs as a 'blank check' pro-competitive alternative to mobile mergers.

In the future, it will be important that evidence on the challenges of striking and maintaining NSAs is taken into account when assessing whether network sharing – and the efficiencies it offers – constitutes a realistic alternative to merging. This is especially relevant in the context of the transition to 5G, where smaller players may lack the necessary scale to make 'full 5G' viable on a standalone basis. Merger control authorities might therefore need to take seriously the efficiencies that can be realised through increasing

[14] General Court of the European Union (2020), Judgment of the General Court of 28 May 2020 — CK Telecoms UK Investments v Commission, Para 298-299

[15] Which we would interpret as efficiencies inherent or automatic to any consolidation.

[16] Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentrations between undertakings available at https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52004XC0205(02)&from=EN

[17] It is far from clear whether one can, in practice, unambiguously distinguish between the two types of efficiencies. This is expected to be one of the points on which the European Court of Justice (ECJ), which will hear an EC appeal against the EGC's judgment, will provide further guidance and clarity.

the scale of 'left behind' players, and have to engage with the question of whether three full-blooded competitors is better than having two and two halves.

This is all the more important in light of the EGC's reversal of the EC's blocking of the O2/Hutchison merger. The court ruling indicates that the EC should put more weight on efficiencies in future merger assessments. This should in turn mean a deeper examination of whether network sharing can plausibly replicate the pro-competitive benefits expected from a merger rather than treating efficiency claims as a largely formalistic part of the merger notification process.

The views presented in this paper are the authors' own and do not reflect the views of Frontier Economics or of any of our clients.

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