

AN ANALYSIS OF THE INTEGRATION OF MOBILE NETWORK OPERATORS: EFFICIENCY GAINS AND DISTORTIVE EFFECTS ON COMPETITION

Can the efficiency gains resulting from the integration of mobile network operators offset distortive effects on competition? Can the level of innovation and, thus, social welfare increase as integration incentivises companies to invest more? The present paper offers an overview of the relevant theoretical models and case law, concluding that network sharing agreements can bring about major static efficiency gains that play a key role in the individual exemption of agreements. This also means that the arguments of merging parties on static efficiency gains might not offer adequate justification for mergers, as the static efficiency gains are not merger-specific. At the same time, from the perspective of dynamic efficiency gains, mergers – given that strong synergies may improve the level of investment – can perform better than network sharing agreements. This means that network sharing agreements can be regarded as an alternative to mergers only to a limited extent. However, relevant case law also shows that (and this is the key competition policy conclusion) long-term benefits have not been properly substantiated so far, and they are usually not sufficiently demonstrated by the parties for the authorities to take them into full consideration.

INTRODUCTION

For the regulators and competition authorities, it is of key importance to identify those market structures where market players are in the best position to offer extensive mobile services for subscribers in an efficient manner. In other words, how many operators with an infrastructure of their own does it take to ensure competitive services in the mobile telecommunications market? Every OECD country has at least three national mobile network operators (MNO), and some have as many as four or five independent networks (*OECD* [2014] p. 5).

However, opinions differ as to which environment contributes most to the efficient operation of the market. Some say that the further dynamic development of the mobile telecommunications market requires close cooperation between operators (including mergers and network sharing agreements) which benefits subscribers through synergies, incentivises investments through maintaining profit levels and promotes the deployment of new technologies (*Frontier-GSMA* [2014],

ESMT [2014], *HSBC* [2014], [2015]).¹ By contrast, others opine that several independent networks must be maintained given that high levels of concentration and cooperation agreements between operators can lower competitive pressure, which, in turn, can result in higher prices and undermine innovation incentives.²

Given the major consolidation process which is currently taking place in the European mobile markets and given the agreements between mobile network operators on sharing networks to different extents (whose number is expected to grow with the rollout of 5G), competition authorities find the question ever more urgent. Can the efficiency gains resulting from integration offset the negative impacts of decreasing competition which inevitably results from mergers and network sharing? The issue is topical for the Hungarian market as well: the Hungarian Competition Authority is investigating the 4G network sharing agreement between Magyar Telekom and Telenor within the framework of a competition proceeding (case number: VJ/18/2015).

To analyse the issue, the present paper describes the mobile market and the mobile network sharing agreements, then discusses the negative market impacts of integration and examines static and dynamic efficiency arguments cited by the parties to justify integration. Static arguments are mostly related to quality, technical or financial gains, while dynamic arguments pertain to investment growth. Having laid down a theoretical basis, the present paper overviews the relevant European case law.

THE MOBILE TELECOMMUNICATIONS MARKET

Market trends and characteristics

The telecommunications market is marked by fast technological development, which results from the innovation dynamics of the market. Investments are cyclic, and a new technology always offers opportunities for further innovation and for the deployment of more advanced versions of the same technology. The telecommunications sector (and especially the mobile telecommunications market) is characterised by an exponential technological development, as new mobile technology generations are introduced commercially, which, in turn, open up the path for yet newer technologies, above all, in the fields of capacity, quality and data transmission, which are of key importance for consumer welfare.

¹ *Frontier-GSMA* [2014] argues that direct competition has not played major role in the price decrease on the market, while innovation does have a significant impact.

² *OECD* [2014] found that MNOs are more likely to deploy and maintain more competitive and innovative services in countries where there are more MNOs in the market.

In the mobile telecommunications market, the first real breakthrough was the rollout of the second generation (2G) networks³ in the 1990s. It replaced the analogue system of 1G with digital data transmission to ensure a better sound quality in calls. 2G technology made the introduction of the first data-type services (text or sms) possible, and, due to the technological developments within the same generation, mms and mobile Internet service were also introduced during 2G. With the launch of 3G technology (more specifically, the 3G infrastructure that uses High-Speed Packet Access or HSPA⁴), data transmission speed and network capacity increased significantly, which, in turn facilitated the introduction and wide take-up of Internet-based services of higher data demand. Consequently, data traffic has been growing each year since then. Based on the data in *NMHH* [2019a] and *KSH* [2019], the majority of the traffic⁵ takes place through a 4G/LTE system.⁶ 4G technology offers larger network capacity, more stable connections and faster and cheaper data transmission for users, which means that it is suitable for the transmission of high-definition (HD) content.

Due to the feedback process (namely that with the launch of an increasing number of higher-quality Internet-based services, the data traffic of consumers is increasing dynamically, which, in turn, encourages operators to roll out new services) the deployment of high-speed mobile networks has become a key priority. The rollout of 5G started in this context. The development of 5G technology allows the spread of applications which require real-time data exchange of very low latency between a large number of devices (such as driverless cars and remote sensors), increases the speed of data transmission and improves network reliability significantly (*NMHH* [2019b]). The sale of the 700 MHz and 3600 MHz bands (designated for the launch of 5G technology by the European Union as a “pioneering bands”) via tendering procedures has already taken place in several European countries, while in other countries (for example, in Hungary) it is still ongoing.

Nowadays subscribers pay lower prices while enjoying a higher quality that results from the development of technology. Nowadays, Europe is experiencing a decrease in the Average Revenue Per Unit (ARPU),⁷ which, to some extent, is offset

³ In mobile telecommunications, one generation refers to a change in the basic nature of the service, a transmission technology that is not backward compatible, with higher peak rates, new frequency, wider channel frequency bandwidth and higher-capacity simultaneous data transmission.

⁴ An advanced 3G technology, which increased data transmission speed and network capacity, while reducing latency.

⁵ As shown by the data in *KSH* [2019] from the end of the first quarter of 2019, 92% of data traffic was already going through a 4G/LTE system in that quarter.

⁶ 4G/LTE: 4th-generation mobile phone technology (Long Term Evolution, LTE).

⁷ Above all, this is attributable to competition and changing consumer preferences. Since serving an additional subscriber involves negligible costs, operators were reducing their prices as the network capacity was improving due to new technologies. Moreover, the decrease in voice and sms revenues has not yet been fully offset by the fees charged for data traffic or for other new services (*OECD* [2014] p. 9 and p. 24).

by the growing number of subscribers. At the same time, if mobile operators wish to remain competitive, they must keep pace with their competitors in a market environment that is constantly changing and evolving. This calls for significant investments in the deployment of new mobile networks and in the rollout of new technologies within a given generation, and therefore necessitates significant capital expenditure (CAPEX) from operators. In the context of such a market environment, the competitiveness of companies depends partly on their capital base, and partly on the return on their investments.

These competitiveness requirements and the significant fixed operating costs (which result in significant economies of scale) made an important contribution to the evolution of ever-closer forms of cooperation between operators, from sharing parts of their infrastructure to mergers. In recent years, during the consolidation wave that swept through the sector, the European Commission examined several mergers in the mobile market. At the same time the number of procedures for examining network sharing agreements between operators (as a possible alternative to mergers) also went up.

Forms of cooperation between operators; the depth of integration

The deployment of mobile networks entails a significant cost for mobile network operators, while the market processes incentivise market players to decrease those costs. This resulted in the emergence of cooperation agreements on mobile infrastructure sharing (as an alternative to mergers), intended to reduce costs.

There are two major types of network sharing. Depending on which parts of the network equipment are shared, there is a passive and an active form of network sharing (EC [2014a]). Both types entail the sharing of passive network elements, that is, of basic infrastructure. These are the devices (towers, cabinets, power supplies, air conditioning systems) which provide location and power for active devices. Active network sharing covers, besides passive devices, active radio equipment (Radio Access Network, RAN), including base stations, antennas and, depending on the technology, controllers. The role of RAN equipment is to directly contact or “communicate” with the devices of subscribers. Therefore, active devices play a major role in determining the quality of the mobile service provided (e.g., coverage, data transmission speed) and, thus, are of paramount importance for competition.

Some active network sharing agreements cover, besides the sharing of passive devices and RAN, the joint use of the parties’ spectrums⁸ as well. This means that

⁸ Spectrums are civilian telecommunications frequencies distributed by the regulator which offer a “way” for communication between mobile subscribers.

	No sharing	Passive sharing	Active sharing	Spectrum sharing/roaming	Full network sharing (joint venture/merger)
Mobile site					
Base station					
Frequency band					
Core network					

Source: EC [2014b] p. 31.

FIGURE 1 • The depth of integration
in the various forms of cooperation between operators

operators can use the available spectrum in the individual bands as a joint resource, which can significantly increase their capacity (*Figure 1*).⁹

As a rule, network sharing agreements do not cover the sharing of network intelligence, that is, the core network, which contains, for instance, subscriber data and manages network resources. When cooperation covers the core network, it is generally regarded as full integration or merger.

THE ROLE OF EFFICIENCY GAINS GENERATED BY MERGERS AND NETWORK SHARING IN PROCEDURES

During the wave of consolidation in the European mobile market, in procedures launched (mainly by the European Commission) to investigate mergers, particular attention was paid to the assessment of the efficiency arguments presented by the parties to support mergers. The key issue was whether the potential efficiency increase was merger-specific.¹⁰ The analysis of this issue raised another critical question in the same field: whether network sharing agreements can deliver the potential efficiency gains of a merger while ensuring that competition between the given parties is reduced to a smaller extent. If yes, the efficiency arguments in favour of the merger should not be taken into account as factors that offset distortive effects on competition, given that there are other ways to achieve efficiency gains which distort competition to a lesser degree.

⁹ In addition to these forms of cooperation, operators sometimes opt for using each other's networks for service provision, which allows them to serve their subscribers outside their own coverage area. This form of cooperation is national roaming, which can be regarded as a form of active sharing. However, it does not require joint network elements, given that one operator forwards its entire traffic to the network of another operator.

¹⁰ When assessing a concentration, a competition authority takes into account efficiency gains arguments when an efficiency gain 1) is verifiable, 2) is linked to the concentration (merger specificity), and 3) benefits consumers (EC [2004]).

In addition, the European Commission and many European competition authorities are examining or have examined agreements between mobile service operators on sharing networks of various levels, typically aimed at the joint deployment of 3G networks in the initial period. In such cases, the question is whether the unfavourable impacts of decreased competition (which, as discussed later, is an inevitable consequence of such agreements) can be offset by the efficiency gains resulting from the agreement.

These two issues introduced above are basically identical. Once they are combined, they boil down to the following questions: Which of the three scenarios (*status quo*, network sharing, merger) offers the highest efficiency gains? Can efficiency gains offset the unfavourable effects of cooperation, such as mergers or network sharing agreements?

Anticompetitive effects

When two mobile operators merge, they cease to compete with each other. Before the merger, if one party had increased its prices, it would have lost some of its subscribers to the other party. However, once merged, the parties take into account that in the case of a potential price increase, some of those subscribers who are lost due to higher prices will flow back to the merged entity through the other merged party, or that, in the event of a full merger,¹¹ those subscribers who otherwise would have opted for the other merging party will remain with the merged entity. This means that the losses resulting from the price increase are lower than they would have been before the merger, which incentivises the parties to raise their prices after the transaction. The same mechanism can be identified with regard to innovation. As the innovating party generates a profit at least partly at the other party's expense (cannibalisation), the profit generated by innovation will be lower after the transaction. Therefore, after the merger, the innovation level agreed on by the parties will be lower than the level they would have opted for independently of each other.

The upward pressure on the prices and the downward pressure on innovation exerted by the transaction (and, consequently, the relevant concerns voiced by the competition authorities) depend, among other things, on how much the competitive pressure is weakened and on the characteristics of the market. Due to the characteristics of the segment (high entry costs, high fixed costs, a high degree of economies of scale), mobile telecommunications markets are highly concentrated in most countries. This means that an increase in concentration is expected to exert a significant upward pressure on prices. Nevertheless, unfavourable effects may be offset by the efficiency gains that result from mergers through synergies.

¹¹ The merged entity may decide to keep the original names of the two companies and appear as two separate "brands" in the market, or to fully merge the two businesses (typically through the integration of the acquired company).

Such efficiency gains may push prices downwards, typically through the reduction of variable costs. However, the mobile telecommunications market is characterised by negligible variable costs, and synergies typically result in fixed cost savings in this market. It is questionable whether such savings can affect the pricing of companies.¹²

In the framework of network sharing, the parties, to a certain degree, use a joint infrastructure to “produce” the service, but retain their independence in other segments of service provision (for example, service portfolio development, pricing, marketing). Therefore – albeit the parties to the agreement decide jointly on investments and the operation of the infrastructure – network sharing agreements do not fully eliminate the competitive pressure exerted by the operators on each other. As a result, the parties are incentivised to continue to compete in the retail market. This is the main difference between a network sharing agreement and a merger.

With regard to the theories of harm raised in the procedures launched by the Commission and European competition authorities to investigate network sharing agreements, a typical key concern is that, in the case of a shared network, the independent control of the parties is reduced, because cooperating operators decide jointly on several network parameters. This may limit infrastructure-based competition and the parties’ ability and motivation to differentiate their services.

As a result of the former fact, the parties do not implement all network expansion, development or upgrade measures which they would perform if they operated their networks independently. This is attributable, among others, to reduced incentives. The expected return on innovation is lower, since the investment has an impact on the subscribers of both parties, which means that it also benefits the operator that continues to act as a competitor at the retail level. Yet when the roll-out of a new technology or service calls for the deployment of a joint network, the innovating operator must consult the other party, which eliminates the factor of first mover advantage from the innovation process. In addition to reducing incentives, such cooperation may reduce the abilities of the parties to innovate, given that typically both parties need to approve the development of a joint network, which means that they can hinder each other.

In some cases, the structure of cooperation may act as a barrier to unilateral developments as well which are independent of the joint network. This is attributable, on the one hand, to technical difficulties (for instance, the integration of independent network components into the joint network) and, on the other hand, to the cost structure of the joint network, which undermines incentives. As a consequence of the latter, unilateral development is less cost-effective for operators, given that the costs of jointly implemented unilateral developments are shared by the two parties.

¹² Fixed costs do not change when the level of production changes, which means they are incurred even if a company is not engaged in production at all. Consequently, fixed costs play a much less significant role in pricing than variable costs do.

The quality of service as perceived by subscribers (for example, data transmission speed), which is a key dimension of competition besides price, is largely dependent on the coverage, capacity and functionality of the network, which, in turn, are mostly determined by the active elements of the network (RAN). When the parties engage in network sharing (especially active network sharing), they typically decide on such parameters together and use RAN jointly. This reduces their ability to offer their subscribers services of substantially different quality, and their services become increasingly similar. Service differentiation would still be possible with unilateral development performed independently of the joint network. But, as explained above, network sharing agreements can restrict such development as well.

To challenge the Commission's concerns about reduced differentiation ability, the parties to the agreements often argue that network sharing allows both parties to offer their subscribers the best quality, and, therefore, differentiation would be possible only in a negative direction, which then would lead to impaired consumer welfare. As far as static considerations are concerned, this argument is difficult to dispute. However, in a dynamic approach and as a consequence of the rapid pace of technological development (due to things like – to cite a current example – the emergence of applications that require real-time data exchange), it is indispensable to keep up competition in service quality in the market, given that operators are capable of improving service quality continuously.

Therefore, network sharing reduces the capacity and incentive to innovate and engage in service differentiation, and thus decreases competition between cooperating operators in the retail market, to the subscribers' detriment.

A potential additional concern pertains to the flow of information between the parties. The flow of information, to some extent, is essential for infrastructure sharing, but it makes the other party's strategy and market position more predictable, and may help the parties establish and maintain coordination even with regard to prices.¹³

Static efficiency arguments related to mergers and network sharing agreements

As a rule, operators put forth two arguments to substantiate the efficiency benefits of mergers. The first argument concerns cost savings that can be achieved with a merger, and the technical gains that stem from access to the other party's infra-

¹³ Other case-specific theories of harm also emerged during investigations performed by competition authorities. These include the following: 1) the reduction of the number of antennas and sites within the joint network may result in coverage problems for those competitors who lease antenna space at the sites of the parties, 2) the parties may acquire a large amount of frequency resources together obtaining a long-term advantage over their competitors, 3) the cost-sharing and settlement system used by the parties may modify the cost structure of the network and, consequently, may create anticompetitive incentives; 4) such agreements may increase the risk of collusion in wholesale markets (DCC [2012], FCCA [2015]).

structure. The parties generally argue that due to these two factors the transaction may allow the company to increase its coverage rapidly and improve service quality (mainly through capacity increases), and pass the cost savings on to subscribers in the form of lower prices. The second argument says that the extra profit generated through consolidation boosts innovation and investment in infrastructure and in new services, which will eventually decrease prices and benefit consumers in the long term.¹⁴ The first one is largely a static efficiency argument, while the second one is dynamic in nature.

However – as shown by the case law discussed later – the static quality (coverage, capacity) and cost benefits of mergers that stem from joint infrastructure can also be achieved through network sharing. The reason for this is that, depending on the depth of integration, infrastructure sharing can ensure significant cost savings for operators. Passive sharing makes it possible to reduce the construction, operating and maintenance costs of passive devices, given that sharing stations reduces the total number of stations required. The amount of savings typically increases as integration deepens. Consequently, active network sharing agreements offer greater savings, as operators also share the operating costs of active assets. Moreover, sharing, similarly to mergers, can increase the network coverage and capacity of operators. It becomes possible to take advantage of the economies of scale that is characteristic of this market, and, provided that spectrum is also shared, to offer a solution to spectrum scarcity.

In the light of the above considerations, the majority of arguments on static efficiency put forward by merging parties will most likely fail to meet the criterion of merger specificity, as – given the fact that retail competition remains in the case of network sharing agreements – the same gains can be achieved in a different way that is less distortive of competition. It should also be mentioned that another requirement for efficiency improvement to be taken into account by competition authorities is that such improvement must serve the interests of consumers (for instance, in the form of lower prices). This means that even if cost savings prove to be merger-specific, it is still uncertain whether they meet this criterion as they typically affect fixed costs, which are less likely to reduce consumer prices than variable costs.

Therefore, in the event of a merger, parties should not focus on such arguments – however, they typically do. Some possible reasons for this approach are discussed below. By contrast, in procedures launched to investigate network sharing agreements, static efficiency arguments may (depending on the depth of the

¹⁴ Innovation enhances the efficiency of production and service delivery, and, therefore, reduces marginal costs and the optimal price, which benefits consumers. Nonetheless, if there is market power, efficiency gains are transferred to consumers only partially, which means that the profit margin of producers/operators also increases (that is, companies do not use up their producer surplus for competition).

given agreement and on market structure) play a major role in offsetting the unfavourable competitive effects, provided that they meet the criteria of individual exemption.¹⁵

*Dynamic efficiency arguments related to mergers
and network sharing agreements*

As shown in the market overview above, investments are of paramount importance for the efficient functioning of the mobile telecommunications market. Operators need infrastructure investment and innovation in order to differentiate themselves from the competition through the data transmission speed, reliability and network coverage. In merger controls, the importance of innovation, enhanced consolidation and the fact that similar static efficiency gains can be achieved through network sharing shifted the debate towards dynamic efficiency issues. One of the important questions is whether network sharing can be comparable to mergers in terms of dynamic efficiency as well. If not, efficiency arguments of this type can be taken into consideration, but it remains uncertain if they are able to offset the negative competitive effects of the transaction.

The relevant literature continues to be divided about whether the consolidation of the mobile telecommunications market increases investment and, if so, whether it enhances consumer welfare as well. There are few theoretical papers on the impacts of network sharing on investments, as it was only in recent years that the issue became of vital importance. So far, no empirical studies have been conducted. The next section gives an overview of the major sources in the literature.

THE RELATIONSHIP BETWEEN INNOVATION AND CONSOLIDATION

The literature devotes much attention to the impact of market competition on innovation, but, for a long time, the various studies seemed to contradict each other. *Schumpeter* [1942/2010] highlighted that the size and profits of monopolies increase a company's ability and incentives to innovate. By contrast, *Arrow* [1962] called attention to the necessity of competition, given that it encourages companies to make innovative efforts through the profit increase that is expected to be generated with innovation.

It was *Shapiro* [2011] who reconciled these two seemingly contradictory views. Shapiro opines that Arrow is right in the sense that if a market is 'contestable', then intense competition for the market encourages innovation. Still, a company must be able to protect its competitive advantage that results from innovation, because

¹⁵ For a cooperation to be granted exemption, all four of the following criteria must be met: 1) the anti-competitive agreement must contribute to efficiency gains; 2) the restrictions must be indispensable to the attainment of the efficiency gains; 3) consumers must receive a fair share of the resulting efficiency gains; and 4) the agreement must not afford the parties the possibility of eliminating competition in respect of a substantial part of the products in question (EC [2011]).

the “appropriation” of innovation gains serves as an important incentive. However, this requires obtaining and maintaining a certain degree of market power, which is in line with Schumpeter’s idea.

Shapiro’s study also falls in line with the theory of *Aghion et al.* [2002], who describe the relationship between innovation and competition as being of an inverted U shape. On the one hand, they emphasise that competition has a positive effect on innovation, as the profit that can be generated by the investing company increases due to the ‘escaping from competition effect’. On the other hand, when competition is too intense, it may reduce the level of innovation (due to the ‘Schumpeter effect’), as low-level appropriation undermines companies’ incentives to innovate.

In view of the contradictory theoretical and empirical evidence on the relationship between competition and innovation, and given the complexity of the issue, economists started to investigate a more specific question: how does consolidation impact innovation efforts and incentives in specific industries?

Shapiro’s paper analyses the impacts of mergers using a framework based on the ideas of ‘contestability’, ‘appropriability’ and synergies resulting from mergers. According to the paper, a merger which significantly reduces market contestability undermines incentives to innovate, but this impact can be counterbalanced by synergies that result from the transaction. Synergies increase the ability and incentive of the merged entity to invest by combining complementary corporate assets.

Genakos et al. [2015] empirically analyse the relationship between investment level and market structure in the mobile telecommunications market. The results show that a merger that reduces the number of market players from four to three results in higher market prices, while investments implemented by the individual operators also increases. However, given that mergers reduce the number of operators, the impact of consolidation on market-level investments is questionable. The analysis failed to find any significant result in that regard.

The papers presented above do not tell us where network sharing agreements fit within this framework; networks sharing agreements also allow savings in operating expenditures (OPEX) and capital expenditures (CAPEX), which, in turn, can incentivise mobile operators engaged in network sharing to maintain or deploy a better network. In summary, the question is which of the three scenarios (*status quo*, network sharing and merger) offers a higher level of investment and consumer welfare.

Motta–Tarantino [2016] were the first to prepare a theoretical study that compares innovation and consumer surplus in the three scenarios. As shown by the results of the model, if the synergies resulting from consolidation are weak, then network sharing and mergers will both lead to a lower-level market investment than the status quo (with mergers outperforming network sharing). This means that the highest consumer surplus (and total surplus) is achieved when companies are completely independent. Mergers and network sharing rank second and third, respectively.

But results change once strong synergies result from the cooperation of parties. As far as investments are concerned, mergers seem to rank first, followed by net-

work sharing and then by the *status quo*. By contrast, in terms of the impacts on consumers, network sharing brings the largest consumer surplus, followed by the *status quo* and mergers. As far as mergers are concerned, Motta–Tarantino [2016] conclude from the above facts that, when putting forward efficiency arguments, merging parties must demonstrate that the same results would not be achievable through network sharing.

Conclusion on static and dynamic efficiency arguments

The first issue to be examined is whether network sharing agreements can achieve the same efficiency gains as mergers do with significantly weaker competition-distorting effects. The second is whether efficiency gains resulting from a merger or a network sharing agreement can offset the negative effects on competition.

To analyse this, two main efficiency arguments put forward by the parties to substantiate mergers or network sharing agreements were presented: static arguments (cost savings, economies of scale and technical gains) and dynamic arguments (higher level of investment). In terms of static efficiency arguments, relevant evidence consistently shows that significant gains can be achieved with network sharing agreements. One of the two consequences of this is that, in mergers, the parties' arguments on such gains are unlikely to be sufficient to justify the merger, given that the same gains can be achieved with agreements, that is, in a manner which is less distortive of competition. The other consequence is that, in procedures launched to investigate network sharing agreements, these arguments may have an important role in the examination of individual exemption, may offset the unfavourable effects and thus, may justify the agreement.

As for dynamic efficiency arguments, it must be noted that, according to the theory, when synergies are significant, the merger can bring about a higher level of investment than network sharing does. In this regard, the *status quo* ranks last. This means that dynamic efficiency arguments can be important for network sharing agreements, given that network investments may increase as a result of cost reductions and better return on capital. However, more importantly, the above indicates that efficiency arguments of merging parties should focus on dynamic efficiency gains (rather than static ones), showing that the same gains cannot possibly be achieved through network sharing. The reason for this is that these are the gains which may justify transactions in the mobile telecommunications market, offsetting the anti-competitive effects.

The section below reviews relevant case law and examines whether the merging parties employ this strategy. To this end, we analyse three mergers that play a key role in mobile telecommunications and illustrate the Commission's approach to dynamic efficiency arguments. The second part of the case law summary reviews some procedures on European network sharing agreements in order to identify cir-

cumstances under which efficiency gains can outweigh the unfavourable effects of such agreements. The position of the Body of European Regulators for Electronic Communications (BEREC) on these issues is also discussed (BEREC [2019]).

THE ASSESSMENT OF THE EFFICIENCY GAINS OF MERGERS AND NETWORK SHARING IN CASE LAW

Merger control

TELEFÓNICA/E-PLUS MERGER, GERMANY (EC [2014a])

Telefónica Germany submitted a merger application in 2013 to acquire the German operator E-Plus. The Commission cleared the transaction in 2014, with commitments. The Commission raised concerns that the transaction would eliminate the competitive pressure exerted by these close competitors on each other and would weaken the competitive position of mobile virtual network operators (MVNO) to the consumers' detriment. The Commission found that the accepted commitments address competition concerns through facilitating the market entry of new competitors and strengthening the position of existing competitors.¹⁶

Given that at the time there were no network sharing agreements on the German market, the Commission, when investigating the efficiency gains of the transaction, analysed whether such an agreement can serve as an alternative to the merger.

The efficiency arguments put forward by Telefónica fall into the categories of demand-side and supply-side benefits. Telefónica argued that the transaction offered additional capacity and coverage, which would improve the quality of the service provided by the merged entity via 2G, 3G and 4G technology. As for the supply side, Telefónica pointed out that the joint rollout of 4G technology would entail lower expenses compared to those that the parties would incur should they deploy and operate the new technology parallel to each other. The parties argued that the consolidation of their 2G and 3G networks would also result in significant savings. Telefónica claimed that this efficiency growth was merger-specific and could not be achieved to the same extent through a network sharing agreement.

That is, the parties did not cite the dynamic efficiency gains, as increased investments attributable to the consolidation; instead, they focused on cost savings. However, with regard to the consolidation of 2G and 3G, the Commission found that the same savings could be achieved via network sharing. As for 4G networks, the

¹⁶ First, Telefónica committed to sell up to 30% of the total network capacity of the merged company to one or more (but maximum three) German MVNOs to ensure the market entry or expansion of new competitors. Second, Telefónica committed to offer a spectrum and certain network assets either to a new entrant MNO or to the MVNO(s) using a part of the network capacity mentioned above. Third, Telefónica committed to extending its existing wholesale contracts with MVNOs and operators and to offer 4G wholesale services to all interested parties.

Commission pointed out that most of the cost savings deriving from the proposed transaction could also be achieved through network sharing covering all technologies. In terms of the demand side, the Commission found that a 2G/3G/4G network sharing agreement would improve network quality to roughly the same degree as the proposed transaction.

HUTCHISON/TELEFÓNICA MERGER, IRELAND (*EC* [2014*b*])

In 2013, the Commission received a notification of a proposed concentration by which Hutchison would take over control of Telefónica Ireland by purchasing its Irish shares. The Commission cleared the merger, with the commitment package¹⁷ submitted by Hutchison. Similarly to the commitments in the German case, the package was intended to help the entry of new competitors into the market.

At the time of the assessment of the transaction, all four operators in the Irish market were parties to network sharing agreements: there was one between Telefónica and Eircom (Mosaic agreement), and another between Hutchison and Vodafone (Netshare agreement). These network sharing agreements played a major role in the Commission's analysis, albeit in a way different from that of the German case, where there were no similar cooperations in the market. In the Irish case, during the assessment of efficiency arguments, the key issue was to establish whether the merger would result in an enhanced efficiency not yet ensured by the existing agreements. Another important question was how the transaction would impact the already existing agreements.

The two main efficiency arguments of Hutchison related to the economies of scale achievable with the merger and the more efficient deployment of LTE. As for the former, Hutchison quantified the net cost savings (deducting the expected gains from Netshare and Mosaic), and argued that such gains cannot be achieved through network sharing. However, the Commission claimed that the parties had failed to take into full consideration the savings expected to result from the Netshare and Mosaic agreements. This was corroborated by the fact that internal documents of the parties showed that the savings expected to be achieved with the implementation of the agreements would be very significant.

Moreover, the Commission had serious concerns that the merged entity could terminate or hinder the Mosaic agreement concluded with Eircom, given that after the transaction Telefónica's profit deriving from the agreement would significantly decrease. In the light of all of this, the analysis of the Commission found that the merger would not achieve higher savings than the two existing network sharing

¹⁷ First, the short-term market entry of two MVNOs is ensured (similarly to the German case, through the sale of capacity), with one of them allowed to acquire the whole spectrum at some later point and thus become a mobile network operator. The second commitment package was intended to ensure the competitiveness of Eircom; to that end, Hutchison committed to maintain the network sharing agreement under more favourable conditions.

agreements do. Again, this corroborates the inadequacy of the static efficiency arguments of the parties.

With their second efficiency argument, the parties claimed that the merger would significantly speed up the deployment of LTE and would result in a higher coverage, given that full independent coverage of the rural areas of Ireland would be very expensive and that the funding restrictions imposed by the Telefónica group would hinder investment in network deployment in Ireland. Nevertheless, the Commission did not consider it plausible that in the absence of the merger Telefónica would undermine its own business interests in Ireland by not investing in an LTE rollout, and concluded that in the absence of a merger a similar 4G network would be deployed. Therefore, Hutchison quantified the consumer surplus deriving from the dynamic efficiency gains to no avail. The Commission largely ignored it on the grounds that it cannot be verified and/or it is not merger-specific.

HUTCHISON–TELEFÓNICA (O2) MERGER, UNITED KINGDOM (EC [2016])

The parties submitted their merger application to the Commission in September 2015. In May 2016, the Commission blocked the transaction due to concerns about price increases and a decreased level of innovation.

In its decision, the Commission called attention to the fact that the given transaction was different from the previous “from four to three” mergers (including the German and Irish mergers), given that the market of the United Kingdom is characterised by extensive network sharing agreements. The merged company would have an agreement with both of its remaining competitors (EE and Vodafone); consequently, the merger would affect the entire mobile infrastructure of the United Kingdom. One of the Commission’s main concerns was, besides the price effects of the merger, the reduced level of investment.

The Commission’s analysis shows that the merged company would get a complete picture of the network deployment plans of its remaining competitors and that the planned implementation of the network sharing (as shown to the Commission) may increase the competitors’ maintenance and investment costs, thus weakening the competitiveness of EE and Vodafone. This means that the decreasing competitive pressure exerted by the competitors, coupled with a reduction of market-level investments, would hinder the future development of mobile telecommunications infrastructure in the United Kingdom, including, for example, the rollout of next-generation (5G) technology.

The efficiency arguments of the parties pertained to capacity increases deriving from technical efficiency, improved network quality, an increased network speed and a price reduction resulting from cost savings. They also claimed that the economies of scale and fixed cost savings brought about by the transaction would enhance the merged entity’s ability and incentive to implement investments in the future. The parties cited the study discussed above (*Genakos et al.* [2015]), which illustrated that consolidation leads to an increased investment level for each operator. The study

concludes that the consolidation does not have a significant impact on the market investment level, but the parties claim that they would use the same investment amounts in a more optimised manner, given that there would be no need to double the same fixed costs.

In the Commission's view, the technical efficiency gains are neither verifiable nor merger-specific (given that they can be achieved with the *status quo* or with spectrum sharing, both of which are less distortive). The Commission found that the arguments on the increased investment level were not verifiable or merger-specific as the parties had failed to provide documentation of adequate detail on relevant evidence and on the assumptions and calculations they had used for the estimation of expected cost savings. The Commission also found that consumers would not perceive the efficiency gains anyway, as the fixed cost savings would not lead to reduced prices.

CONCLUSIONS BASED ON CASE LAW

As for static efficiency arguments, relevant literature and case law consistently find that most benefits of mergers can be achieved through network sharing, as it allows the parties to make optimal use of networks and to exploit the benefits resulting from the economies of scale. The Commission finds that, on markets where there are such agreements in place, a possible alternative to the merger is to extend them. Nevertheless, in some cases, the extension of existing complex agreements may not be feasible or may not be adequate to achieve gains equal to those achievable through mergers and, therefore, in theory, mergers may lead to additional efficiency. Still, in the case of complex network sharing, the Commission may find (just as it did in the case of the United Kingdom) a theory of harm with regard to the fact that the merged company may terminate or hinder such agreements, which is unlikely to be offset by additional efficiency gains. It should also be noted that, as shown above, it is not clear by what mechanism the reduction of fixed costs (intended to offset the negative impacts) would lead to price reduction.

As for dynamic efficiency arguments, it must be noted that, according to the theory, when synergies are significant, the merger can bring about a higher level of investment than network sharing does. In that regard, the *status quo* ranks last. Most probably, the synergies achievable with the transaction were significant in the first case, on the German market, given that at the time no network sharing agreements were in place there. However, the parties failed to put forward arguments for dynamic efficiency gains (increased investments) resulting from consolidation. Instead, they focussed on cost savings, which, in the Commission's opinion, were not merger-specific. In the two other cases, the synergies achievable with the merger were presumed to be less significant due to market structure. Still, the parties presented some arguments related to higher levels of investment, which they substantiated with references to *Genakos et al.* [2015] (discussed above). However, the Commission rejected these potential benefits, largely on the grounds that they

were not verifiable. The Commission discussed the paper by *Genakos et al.* [2015] in a separate Appendix to the Hutchison-O2 UK decision, arguing that the study's finding that reducing the number of operators from four to three would not have any significant effect on market-level investment did not necessarily imply that investment would be "better spent" in more concentrated markets to the benefit of consumers. However, the Commission did not examine how the investment structure of the market would change after the transaction, nor has an empirical analysis been made on the impacts of some market distributions of investment.

Recently, the Commission received a lot of criticism for not focusing more on dynamic efficiency arguments in its decisions, when, in fact, long-term considerations play a key role in a given market. The Commission's reluctance is attributable, on the one hand, to the fact that theoretical models and empirical analyses have not offered much in the way of consistent evidence on the effects of mergers on investment, and on the other hand, to the fact that future efficiency gains are, by their nature, difficult to quantify or verify, given that they are surrounded by significant uncertainty. In the light of all this, the parties do not seem to have any incentive to rely on dynamic arguments or present them robustly, although as for robust presentation, it is to be noted that the options of the parties depend very much on the degree of the uncertainty surrounding their arguments.

Procedures initiated to investigate network sharing agreements

In the period from 2012 to 2017, many national competition authorities investigated existing network sharing agreements in the mobile telecommunications market, and several competition and regulatory authorities issued guidelines on such practices. The following section gives a short overview of the cases that have been closed so far and of the Czech procedure carried out by the Commission, where the Commission sent the parties the Statement of Objections in August 2019. The chapter concludes with an overview of the guidelines issued by the French competition authority and the position of the Body of European Regulators for Electronic Communications (BEREC).¹⁸

The DANISH CASE (*DCC* [2012])

On the Danish market, which has four market players, Telenor and Telia Denmark (the second and third biggest operators by market share, respectively) set up a joint venture by which they jointly own, control and develop their RAN infrastructure for all mobile technologies (2G, 3G, LTE). The active sharing agreement entails the

¹⁸ BEREC contributes to a consistent application of the EU regulations to ensure the adequate operation of the single market of electronic telecommunications. BEREC comprises a Council of Regulators, consisting of the heads of the national regulators of the EU member states (www.europa.eu).

sharing of both physical RAN infrastructure and frequency resources, but does not cover the core network.

The parties submitted commitments to resolve five of the six concerns raised by the Danish Competition and Consumer Authority (DCC). The sixth and main concern of the DCC is that the agreement reduces competition on the retail mobile telecommunications market on significant parameters such as coverage or the launching and deployment of new network technologies. However, regarding that concern, the DCC found that the parties provided sufficient proof that their efficiency arguments fulfil the conditions set out in Article 101(3) of TFEU and in the relevant article on the Danish Competition Act. The reason for that is that network sharing ensures that both Telia and Telenor can continue to provide their independent services via a better and more efficient network, which will benefit subscribers through better coverage and better performance offered by the various technologies.

The FINNISH CASE (FCCA [2015])

In Finland, two of the three market players (DNA and TeliaSonera, the businesses with the second and third largest market share) set up a joint venture. The cooperation entails active network sharing without spectrum for 2G and 3G, and with spectrum sharing for 4G. The cooperation extends only to rural areas, and therefore affects only 15% of the population (50% of Finland's area).

The main potential competition concern raised by the Finnish competition authority was that, due to the reduced differentiation ability of the parties, the agreement would weaken competition in quality parameters (coverage, speed and other features). The competition authority also claimed that the parties would be less motivated to invest in the network and that the exchange of sensitive business information would facilitate market collusion.

To address these concerns, the Finnish competition authority required DNA and TeliaSonera to implement the commitments¹⁹ that they offered. The Authority also highlighted that cooperation would result in, besides costs savings, a faster and more efficient network for subscribers in Eastern and Northern Finland; however, the benefits would only be achieved if the parties continue to engage in strong competition as ensured by their commitments.

As the BEREC common position, to be discussed later, explains, the possibility of infrastructure-based competition (which depends very much on the characteristics of the areas concerned) is an issue of key importance when it comes to the

¹⁹ The Finnish competition authority accepted the following commitments: 1) the parties restrict information exchange with each other; 2) both parties will have their own unilateral network and business plans, and will be entitled to introduce new functions or additional capacity in the joint network; 3) the parties will provide mobile virtual network operators (MVNOs) access to all wholesale services under conditions similar to the current ones; 4) the parties will not remove sites that become redundant as a result of the cooperation, but offer them for lease for competitors under market terms.

assessment of the impacts of network sharing. The reason for this is that in sparsely populated areas, the deployment of a network owned by a single party can entail significant costs, and operators may not be incentivised to do so. In such cases, network sharing can have significant benefits, in some cases even increasing the number of infrastructures of the given technology deployed in the area.

THE SPANISH CASE (CNMC [2015])

The Spanish competition authority (CNMC) investigated several agreements between Telefónica and Yoigo, the first and fourth largest operators (out of four) in the Spanish market. Under the mutual national roaming agreements, Yoigo may use the 2G, 3G and 4G mobile networks of Telefónica, while Telefónica has access to the 4G network of Yoigo. In the view of the CNMC, the latter form of cooperation restricts the parties' differentiation ability with regard to coverage and network quality, and, thus, restricts competition between the parties, reducing the parties' motivation to invest in the deployment of their own network. The CNMC did not accept the efficiency arguments presented by the parties in those areas where both operators have deployed or could potentially deploy a network of their own.

As for the passive network sharing agreement between the parties, the CNMC established that, given the efficiency gains, the agreement was granted exemption under Article 101(3) of TFEU.

THE CZECH CASE (EC [2019])

This case, investigated by the Commission, is about the cooperation of the two biggest operators of the Czech market, T-Mobile and O2/CETIN. The network sharing covers all technologies (2G, 3G, 4G), but does not include spectrum sharing, and it covers the whole territory of the country except Prague and Brno, covering 85% of the national population.

While investigating the case, the Commission took into account several factors that result from the structure of the Czech market, for example, the high concentration of the three-player market, where the networks of the parties serve approximately three quarters of subscribers. The latter fact makes for an important difference between the Czech case and the Finnish one presented above, inasmuch as the Finnish agreement was limited to sparsely populated areas and, therefore, affected only 15% of the Finnish population. In the Czech case, however, it is more difficult to see, for example, why in the absence of the agreement T-Mobile and O2 would not be incentivised to invest if promoting their business was their market interest.

In the Statement of Objection issued in August 2019, the Commission concluded that the network sharing agreement restricted competition and, therefore, limited innovation. According to the Commission, network sharing in this case is likely to eliminate the incentive for the two mobile operators to develop their networks and services instead of achieving better efficiency and higher service quality. This clearly shows that the Commission rejected any efficiency arguments that parties may have put forward.

POSITIONS ON THE IMPACTS OF NETWORK SHARING

In 2013, the French competition authority issued a guidance document on conditions under which networks sharing between operators may be approved (*Autorité de la concurrence* [2013]). In its opinion, the Authority highlighted the importance of infrastructure-based competition which incentivises innovation and product differentiation. The Authority also noted that the rollout of new technologies requires significant investment and that cost-sharing can allow a faster deployment and a better coverage. The Authority also noted that the alternative of sharing, that is mergers, are not to be supported given the significant level of concentration in the French market.

The French competition authority considers that the impact of network sharing agreements on competition should be assessed on the basis of three main criteria. The most important is the nature of the cooperation (passive, active or spectrum sharing). The competition authority considers spectrum sharing as particularly restrictive of the parties' differentiation ability. The second criterion is the market power jointly acquired by the operators involved in the sharing, and the ability of other competitors to offset the impacts. The third and last criterion specified by the competition authority is the characteristics of the areas covered by the agreement, particularly their population density, given that in densely populated urban areas cost savings are less likely to be achieved.

The common position issued by BEREC offers guidance for national regulators on the criteria to be taken into account in the assessment of mobile network sharing agreements. *BEREC* [2019] identified numerous parameters that are relevant for the impact on competition and for the assessment of the efficiency arguments submitted by the parties; therefore, the common position provides useful guidance for competition authorities, too. Such factors include market share, the number of operators involved in the sharing, the technologies involved and the geographic scope and the time frame of the sharing.

BEREC finds that the impacts of sharing differ according to the depth of infrastructure integration. Passive sharing has little impact on competition in the market, while active sharing may significantly reduce infrastructure-based competition and the operators' incentive to engage in infrastructure development. Nevertheless, the feasibility of infrastructure-based competition depends very much on the geographical circumstances of the areas concerned. The promotion/protection of infrastructure-based competition is of paramount importance in areas of high population density as it incentivises investment, infrastructure and efficient competition. By contrast, in sparsely populated areas, stand-alone deployment can be very costly, and network sharing can help reduce the costs, leading to efficiency gains that noticeably benefit subscribers.

In general, according to BEREC, passive infrastructure sharing should be encouraged given that, in most cases, it creates only minor distortions of competition while offering significant efficiency gains (cost savings, faster deployment, greater cover-

age). As for active network sharing agreements, the impact of cooperation depends to a great extent on the specificities of the area and, therefore, on the feasibility of infrastructure-based competition. However, such cooperations have a greater impact on the market, with the specific benefits and drawbacks varying from case to case. According to BEREC, national roaming agreements give rise to most concerns, as they may limit investment incentives considerably. This means that long-term roaming agreements should be restricted to specific areas; for example, to areas where infrastructure-based competition is not a feasible option.

CONCLUSIONS BASED ON CASE LAW

A general conclusion on network sharing agreements is that the more extensive the form of cooperation opted for by the parties, the more significant its unfavourable impact on the market. Yet, at the same time, the efficiency gains resulting from sharing also increase with the depth of asset integration; therefore, in the case of active network sharing the assessment of efficiency arguments plays an important role. Such arguments tend to centre around static arguments (related to costs savings) rather than around dynamic ones, and, as a rule, they are thoroughly analysed by competition authorities. As for active network sharing, the benefits are more likely to offset potential unfavourable impacts of the agreement in those typically sparsely populated areas where it would be expensive to deploy a parallel infrastructure in the *status quo*, and, in the absence of the cooperation, the parties would achieve less coverage and capacity.

CONCLUSION AND OUTLOOK

This study examined whether the efficiency gains resulting from integration can offset the unfavourable impacts of the reduction in competition caused by mergers and network sharing agreements. In the light of our analysis, it appears that arguments relating to static efficiency gains are not successful in merger cases, because the same gains can typically be achieved through network sharing and because in some cases there is no clear mechanism through which these efficiencies would lead to consumer benefits. However, in procedures launched to examine network sharing, such arguments can prove more convincing as far as offsetting the potential negative impacts are concerned. By contrast, dynamic efficiency arguments are more likely to justify a merger, but dynamic efficiencies are generally characterised by a high degree of uncertainty and, consequently, are difficult to verify and quantify. Therefore, the authorities typically ignore such arguments, should the parties submit any.

Overall, the Commission's doubts about efficiency arguments are justified, because, due to the specific characteristics of the industry, mergers are expected to exert a significant upward pressure on prices, while the realisation of efficiency gains is uncertain. In this context, the Commission is sending somewhat mixed

messages to the market in an environment where, with the introduction of 5G, consolidation efforts and agreements on network sharing of different degrees are becoming increasingly important. The Commission, which (with the exception of the merger prohibited in the UK in 2016) was relatively permissive with regard to notified mergers e.g. in the German, Irish and Italian market, now appears to be taking a tough stance on the Czech network sharing agreement.

According to José Perdomo Lorenzo, CEO of T-Mobile Czech Republic, the Czech case may destabilise 5G investments which are of paramount importance for all European telecommunication operators (*Aranze* [2019]). However, it is most likely that the preliminary position of the Commission only serves to inform the market of the fact that (as BEREC presented in its position) network sharing can achieve more efficient market outcomes only in certain market environments, while in other cases the protection of infrastructure-based competition is seen as a priority.

Moreover, it is difficult to draw conclusions on the effects of 5G cooperations from relevant existing case law, because 5G is a fundamentally new technology, and the technical and other conditions for future network sharing are still unclear. In any case, it can be concluded that if operators aim to realise the efficiency gains deriving from cooperation, then they should keep in mind that the Commission and the European competition authorities are still more likely to approve network sharing than a merger, until new evidence emerges to substantiate that mergers promote innovation.

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