



European mobile network operator mergers

A regulatory assessment

December 2014



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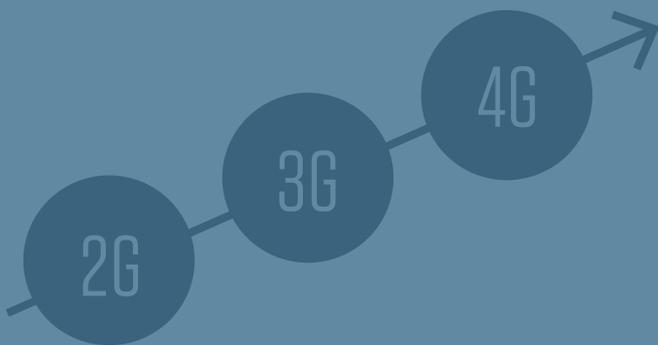
This briefing report has been produced by Frontier Economics at the request of the GSMA. It summarises the key findings of a longer report which the GSMA expects to publish early in 2015. The GSMA welcomes comments and feedback on the contents of this document to ensure a fair and balanced view of the current landscape. To register to receive the full report in early 2015, or to comment on this report, please email publicpolicy@gsma.com.

CONTENTS

SUMMARY	4
BACKGROUND AND CONTEXT	7
THE AVAILABLE EVIDENCE SUGGESTS INVESTMENT IN NEW TECHNOLOGY IS THE MOST IMPORTANT DETERMINANT OF CONSUMER OUTCOMES IN MOBILE MARKETS	9
MERGERS CAN INCREASE INCENTIVES TO INVEST	12
THE AVAILABLE EVIDENCE IS NOT CONSISTENT WITH THE HYPOTHESIS THAT FOUR-TO-THREE MOBILE MERGERS SHOULD IN GENERAL BE EXPECTED TO LEAD TO HIGHER PRICES	16
REASONS WHY GUPPIS ARE LIKELY TO OVERSTATE UNIT PRICE EFFECTS OF MOBILE MERGERS	20
THE ROLE OF MAVERICKS MAY BE LESS SIGNIFICANT IN FUTURE	22
NETWORK SHARING CANNOT BE EXPECTED TO DELIVER THE SAME BENEFITS AS A MERGER	23
REMEDIES MAY UNDERMINE THE POTENTIAL BENEFITS FROM MOBILE MERGERS	25

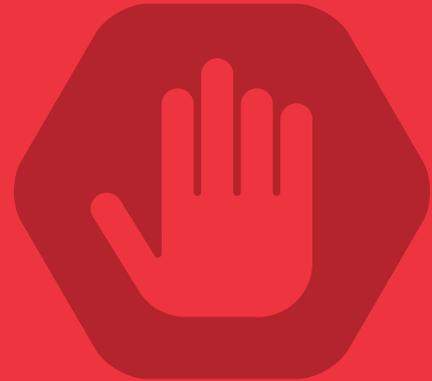
European MNO mergers: A regulatory assessment

Why is consolidation important?



Consolidation can boost investment in next-generation mobile infrastructure

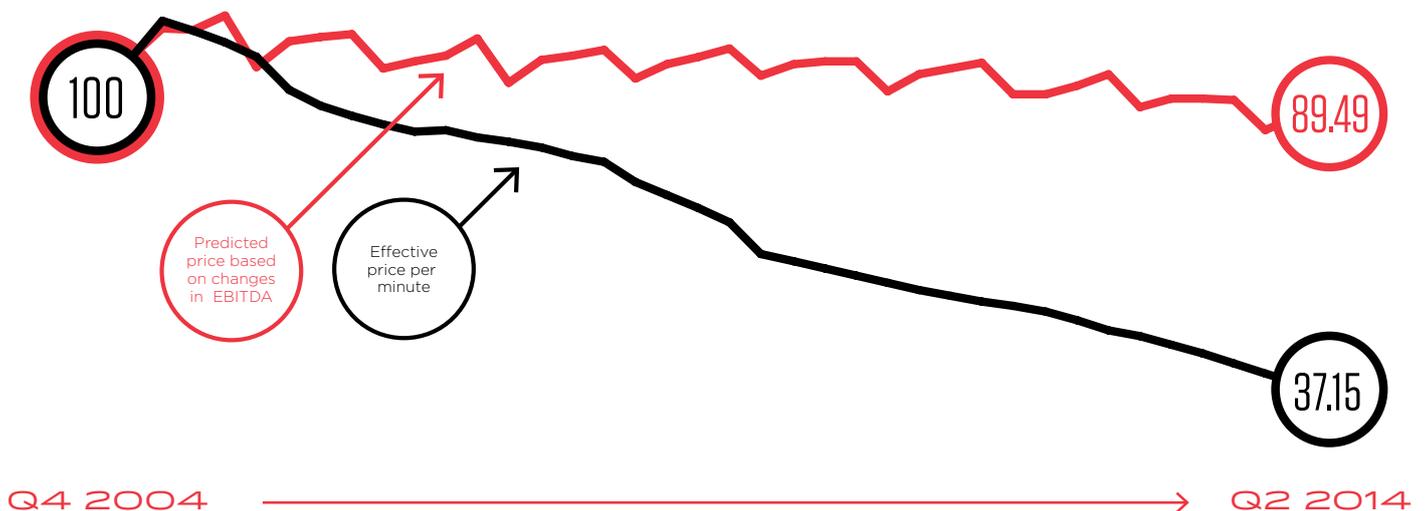
What's happening?



Merger reviews focus on short-term price implications rather than long-term consumer benefits

Is this a valid concern?

Consumers benefit from increased investment through new technologies that improve quality and reduce unit prices



Why is consolidation good for the market?



Consumer cost



Quality
and speed



Investment and roll-out
of network and services

Network sharing will not deliver the same benefits as a merger



Fewer cost savings to
pass onto consumers



Reduced incentive for
network investment



Less control over
networks and service quality



A challenge for
long-term partnerships

**Mergers can drive investments
required to provide long-term socio-economic
benefits for consumers and business**

Summary

There have been recent mobile mergers in Europe, including in Germany, Ireland and Austria, where the number of mobile network operators has fallen from four to three, and much debate about the merits of mobile industry mergers in general. This briefing report provides a regulatory assessment of the case for mobile mergers in Europe. To date, competition authorities have tended to centre on the short-term pricing implications of mergers, with a significant focus on the Gross Upward Pricing Pressure Index (GUPPI), which estimates the incentive of the merged firm to raise prices. However, authorities have paid less attention to the impact that such mergers could have on efficiencies or investment. Where mergers have been approved, they have been subject to significant resolutions/constraints such as spectrum divestment or network sharing deals.

We find that there are a number of ways in which the assessment of mobile mergers could be improved in future:

- **More focus on investment.**

At present, the European Commission generally starts by considering whether a merger will lead to short-term increases in prices, and then subsequently analyses whether the merger could also lead to efficiency gains and higher investment over the longer term to offset the price increases that it predicts. Our analysis suggests that this is to put the cart before the horse when it comes to the mobile industry. This is because, first, dynamic efficiencies from investment in mobile markets – which are not generally captured at all in GUPPIs¹ – play a large role in determining outputs, including prices, of an industry in which major technology changes occur every 8-10 years (rather than every 30 or 50 years, as in many other industries). Thus, we find that most of the reduction in unit prices in Europe between 2004 and 2014 is explained by investments in new technologies rather than from reductions in margins that result directly from competition. Second, we find that mergers can significantly increase the incentives of the merging parties to invest under some circumstances. We provide evidence of this based on a merger in the UK. We conclude that, given that the potential benefits (including lower prices) for consumers from higher levels of investment are so significant in the mobile industry, competition authorities should pay greater attention to the impact that a merger will have on the incentives of the affected parties to invest. This suggests that authorities should examine the impact of the merger on market performance in a more holistic way (and over a long time period), rather considering dynamic factors as part of a separate efficiency assessment having already drawn conclusions about prices.

- **Reconsider the use of GUPPIs.**

We also find that the reliance on predicted price increases used by competition authorities, whilst providing a helpful starting point, seems unable to capture the complexities of the competitive process in mobile markets. These metrics should not be expected to provide reliable predictions of the impact of mobile mergers on prices. Our cross-country review of market performance, which covers more than a decade, finds no evidence that unit prices in three player mobile markets are systematically higher than those in four player markets, which is a necessary condition under the GUPPI framework currently used by competition authorities. This does not mean that no merger would ever be expected to lead to higher prices – but it suggests that the tools and inputs being used may not adequately capture the drivers of mobile market performance, even in the short term, in many circumstances.

1. GUPPIs attempt to capture the upward pricing pressure from mergers based on the closeness of competition (diversion ratios) between the merging parties and the margins of customers recaptured as a result of the merger.

• **Discount benefits of network sharing.**

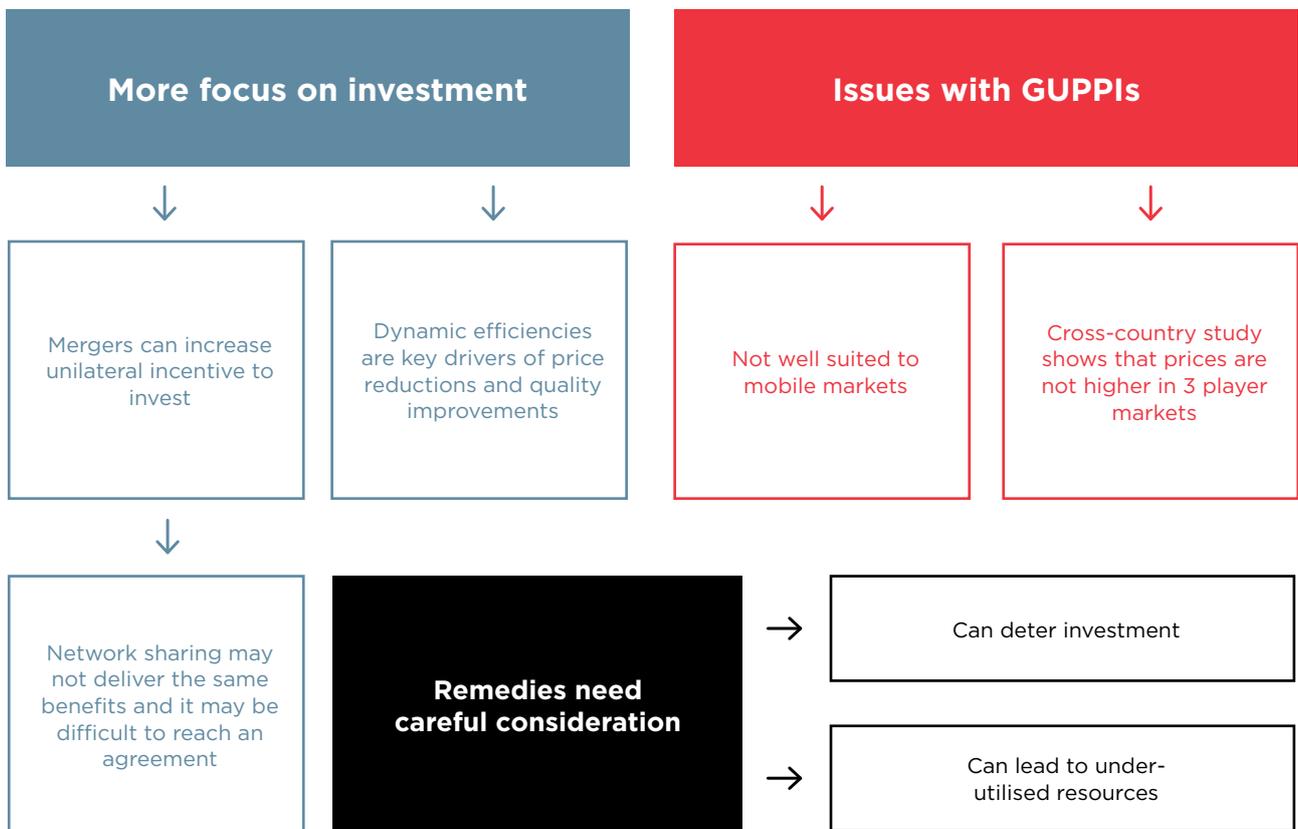
Competition authorities have also argued that network sharing can result in most of the claimed benefits of mergers without the risk of price increases (which we believe to be overstated in any case). Network sharing can deliver benefits over no sharing at all, but it cannot create the investment incentives which we identify as driving significant benefits in some mergers and to which competition authorities should pay particular attention. Moreover, there is no reason to suppose that benefits that can be attributed to network sharing are more certain to be realised than those attributed to mergers.

• **More careful consideration of remedies.**

Remedies are supposed to address the competition problems which the authorities predict would as a result of a merger arise. If these problems are not specified accurately (as we suggest can occur with the use of GUPPIs), then the remedies will also be inappropriate. However, as well as being misdirected at problems which may not arise, some remedies may prevent the realisation of the very benefits which might otherwise result from the merger. In particular, remedies which may reduce either the incentive or ability of the merging parties to increase investment will harm consumers in the market in question and may deter beneficial mergers in other countries.

Figure 1

Summary of key conclusions of study



Source: Frontier Economics

Background and context

There has been much debate over the last few years about the impact of mergers on the performance of mobile telecommunications markets, particularly if the number of network operators is to reduce from four to three. Competition authorities on both sides of the Atlantic have expressed concerns about the impact of such mergers on prices for consumers. The US authorities have recently opposed a four to three merger (between Sprint and T-Mobile) whilst the European Commission has approved three such mergers (in Austria, Ireland and Germany), but only after extracting significant concessions in each case. On the other hand, the merging parties have generally argued that concerns about post-merger price increases are overstated and should be considered over the long term. Mergers can be a catalyst for driving higher levels of network investment which result in improvements in quality, innovation and, ultimately, lower prices.

In any merger case, both the merging parties and the competition authorities are required to speculate about the future. Neither can be sure what will happen and how the market will actually perform if the merger proceeds. Equally, neither can be sure what will happen if it does not. The claims cannot be tested or validated before the merger occurs.

It is against this background that the GSMA has asked Frontier Economics to undertake this study. This study has not been prepared in connection with any particular merger proceeding and does not attempt to predict the outcome of any specific merger. It does not, therefore, attempt to replace or reduce the need for competition authorities to undertake detailed scrutiny of mobile mergers when presented with them. Rather, its purpose is to review as much of the historical evidence available on the performance of mobile markets to identify the key drivers of long term consumer outcomes. The report then considers the implications of how mobile markets function for the assessment of mergers by competition authorities.

We consider how markets with different numbers of operators in different countries have performed, and also how markets in the same country have performed before and after mobile mergers have occurred. We consider how mobile markets deliver innovation, improvements in quality as well as reductions in unit prices, since all of these occur regularly in the mobile industry and all are important to expanding consumer and social welfare. We explain why network investment is a key driver of all these outputs in mobile markets, and we consider what might influence investment incentives for mobile operators. Since a large element of network investment in the mobile industry is driven by a succession of technology cycles² (which occur with remarkable regularity in the mobile industry and show no signs of ending), it is important for competition authorities to take a longer term perspective. This then explains only how mobile markets perform during a particular cycle, but how mergers might also affect their capacity to move from one cycle to the next.

The rest of this briefing report is structured as follows:

- **First**, we explain why the available evidence suggests that investment is the most important determinant of consumer outcomes in the mobile industry;
- **Second**, we set out why the available evidence suggests that four-to-three mergers will not lead to higher prices; and
- **Third**, we explain why some remedies may undermine the potential benefits from mobile mergers

2. Investments in the mobile industry are generally catalysed by new technology cycles, which are also often accompanied by (and precipitated by) the release by Governments of new radio spectrum against which network investments are then made. Given that we find that unilateral investment incentives are a key motivation for many mergers, it is no coincidence that many mobile mergers occur when the industry faces a new technology cycle (as Europe faces in the transition from 3G to 4G today).

The available evidence suggests investment in new technology is the most important determinant of consumer outcomes in mobile markets

We start by explaining the role that competition and investment play in mobile markets. We focus on prices, but consumers also benefit enormously from improvements in the quality and functionality of mobile services.

In any market, prices can fall for the following reasons:

- Prices can fall as a result of firms being more productive when using the same technology and thereby reducing/minimising costs, for example, by re-organising the operations of a company, or simplifying its procurement processes, etc. This is called (static) productive efficiency.

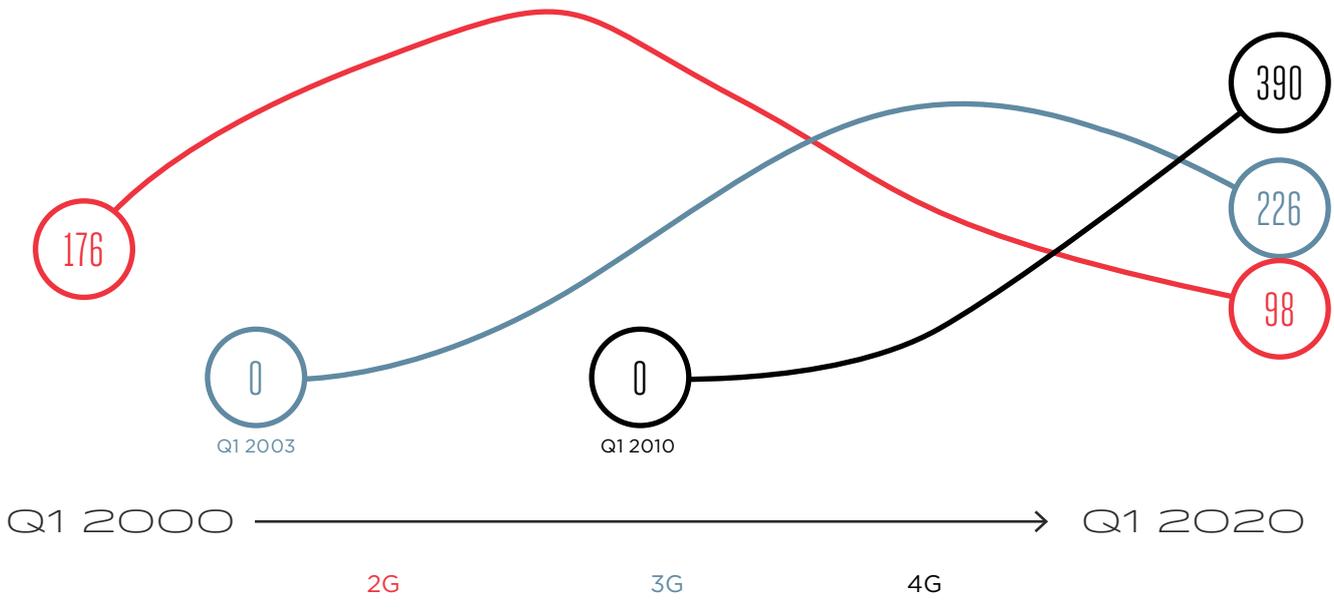
- Prices can also fall due to dynamic efficiencies, which occur as a result of strengthening of competition and/or when firms invest in superior technologies and thereby reduce costs (and generally also improve the quality of existing services and enable new services which would otherwise not be produced).

In mobile markets, dynamic efficiencies are a key determinant of market performance and, hence, consumer outcomes. Mobile markets follow technology cycles that last for 7-8 years. This compares to the 15-50 year cycles in many other industries³. These short cycles in mobile markets look set to continue with the current roll-out of 4G and preparation for 5G technologies.

Figure 2

Technology cycles in EU mobile markets

Connections, Millions



Source: GSMA intelligence

Note: analysis relates to EU28 countries except for 4G connections which does not include Cyprus due to lack of data availability

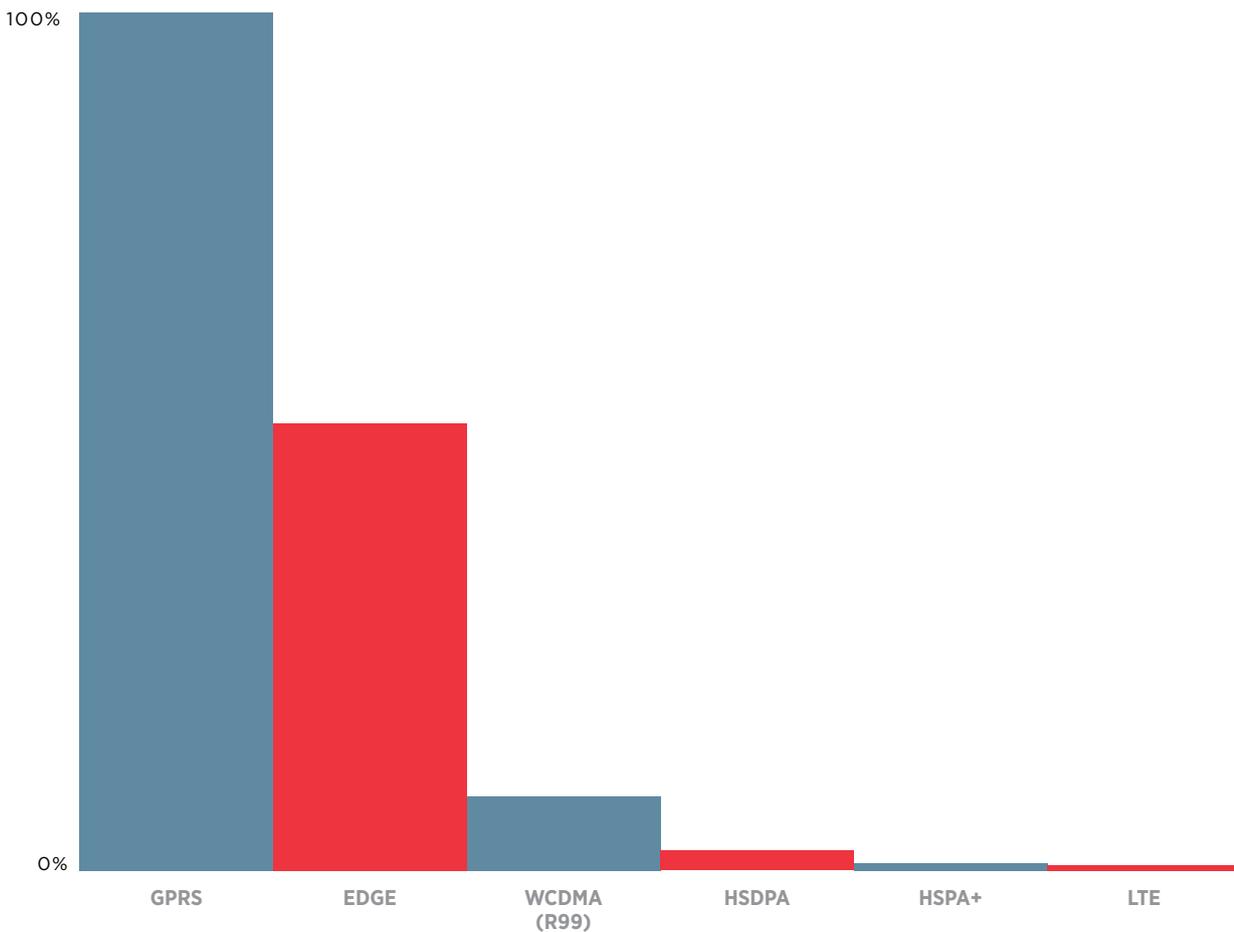
3. Such as radio (which introduced FM technologies about 50 years after AM, and DAB which was produced another 50 years after FM) or TV (which introduced colour in the 1960s, 30 years after television was first launched, and introduced DTT in the late 1990s, another 30 years later)

Market performance in an industry such as mobile therefore needs to be assessed across technology cycles, since these are periods during which large investments are made by the mobile industry to deliver:

- (a) significant increases in total capacity (both through investments in new infrastructure and through investments in new spectrum) and
- (b) significant improvements in the utilisation of capacity (i.e. the volume of data that can be supported over existing spectrum and network).

New network technology cycles also unlock new cycles of innovation in services and devices along the supply chain (such as 3G and the iPhone), which then drive further growth in user demand for new services. As shown by the figure below, in mobile markets, new technology cycles produce dynamic efficiencies which translate into very large reductions in unit costs (often by a factor of five or more).

Figure 3
Cost per MByte as a % GPRS⁴



Source: Telstra presentation at Mobile World Congress

4. GPRS and EDGE are 2.5G technologies. WCDMA R(99) is a 3G technology. HSDPA and HSPA+ are 3.5G technologies. LTE is a 4G technology.

Evidence of the impact of dynamic efficiencies on unit prices can be illustrated by trends in the intensity of competition and unit prices over time. We have examined the trend in EBITDA margins and unit prices⁵ for the longest time period for which we were able to obtain consistent data – from 2004 to 2014 – for EU28 countries.

The fall in EBITDA margins between 2004 and 2014 would suggest that unit prices should have fallen by 10%. However, in reality, unit prices fell by 63%. This is consistent with the vast majority of unit price reductions arising from dynamic efficiencies as a result of the transition from 2G to 3G technologies during this period⁶.

Figure 4

Unit price reductions compared to changes in EBITDA margins in EU markets



Source: **GSMA intelligence**

Note: analysis does not include Cyprus, Estonia, Luxembourg, Malta or Slovakia due to lack of data availability. The expected prices due to changes in EBITDA margins have been calculated as $\text{Price} = \text{Unit cost} / (1 - \text{EBITDA margin})$ assuming that unit costs have stayed constant over time.

5. There are different ways in which 'prices' can be measured. To be able to obtain the most comprehensive series, we have used country-level data on average revenue per minute.
 6. We note also that the later period is associated with a significant economic slowdown and greater regulatory intervention compared to the earlier period, hence the reduction in EBITDA margins may not reflect any structural change in the intensity of competition in mobile markets.



Mergers can increase incentives to invest

The greater significance of dynamic efficiencies from investment in technology in mobile markets (compared to many other sectors of the economy) suggests that particular attention needs to be paid to the impact that mergers may have. Mergers impact on the ability and incentive of operators to invest, both in terms of investment in existing technologies within the technology cycle and in terms of the capacity of the market to move from one cycle to another.

Competition authorities have generally been sceptical of the benefits for consumers from merger efficiency gains, arguing that any reduction in competition is only likely to weaken incentives to invest. Merging parties have sometimes appeared to argue that a reduction in competition is required to strengthen incentives to invest. However, economists have long recognised that the relationship between competition and investment is more complex than this. There should not be any presumption that a more concentrated market will either increase or reduce the incentives to invest.

It is useful to start by distinguishing between the potential impact of a merger on the incentives of the merging parties to invest (which we call ‘unilateral’ incentives) and the potential impact of a merger on the incentives of all of the operators in the industry to collectively invest (which we refer to as ‘multi-lateral’ incentives).

If we consider unilateral incentives first, then mergers can impact operators' incentive and ability to invest in the following ways:

- **First**, operators are likely to benefit from a larger customer base leading to economies of scale, which are widely recognised to be significant in mobile markets⁷. Economies of scale are likely to improve operators' incentive to invest, as they increase the profitability of both expanding coverage to new areas and upgrading the capacity of networks in existing areas. Merged operators can spread any fixed investment costs over a greater number of subscribers and/or higher level of usage.
- **Second**, mergers may allow the merging parties to combine assets which create investment opportunities which would not otherwise arise. For example, by combining the spectrum holdings (or retail networks) of the two merging parties, the combined entity may be able to exploit the resulting spectrum to offer better quality or faster services than its rivals or than either party would have otherwise been able to do on its own.

It is important to note that the opportunity to unilaterally invest to gain a competitive advantage (either as a result of obtaining greater scale than rivals or as a result of assembling a collection of other assets which rivals cannot readily replicate) is likely to be an important reason why firms might decide to merge. How strong these incentives actually are will depend upon the circumstances in which any merger is being contemplated.

For example, if the result of the merger is to create a new market leader just at the point of transition from one technology cycle to the next (for example, from 3G to 4G), then this could allow the merging party to launch a new technology much earlier and more aggressively than would otherwise have been the case (forcing others to follow). This would be likely to have a very considerable impact on consumer welfare. We note that the merger between Orange and T-Mobile in the UK, allowed the new entity, EE, to roll-out 4G earlier and more quickly than would have been the case absent the merger (and much earlier than its rivals).

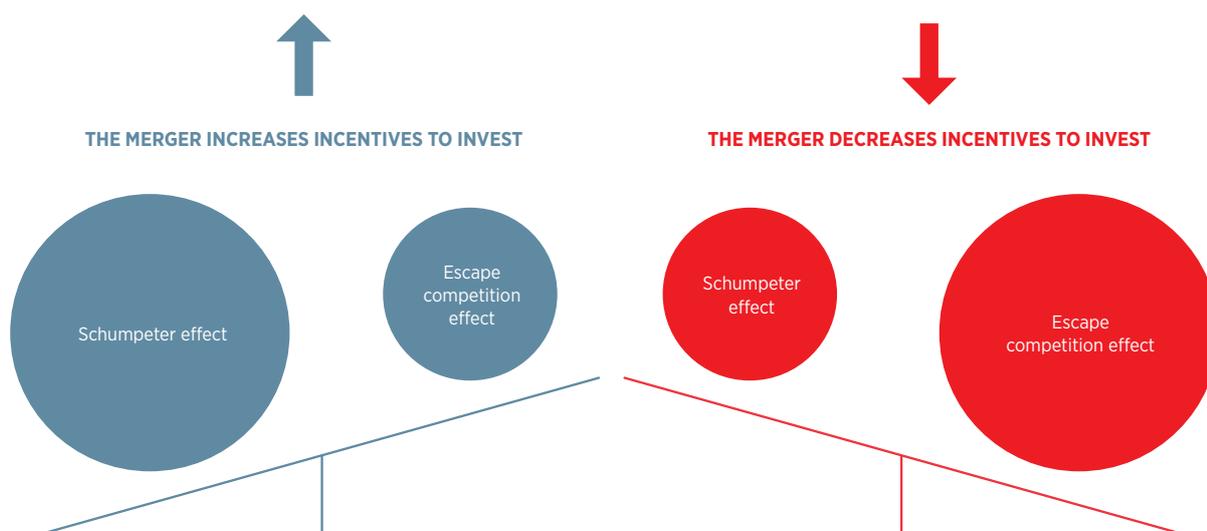
On the other hand, if a merger instead involves two smaller players, then this may allow these players to catch-up with the other firms in the market. This could also lead to consumer benefits, although the benefit may not be as large as those achieved when the merger produces a new market leader. Similarly, a merger that is undertaken when there is no immediate prospect of a new technology being launched may have a smaller impact on market performance.

The impact of mergers on the wider industry's (or 'multi-lateral') incentive to invest depends on two opposing effects. In all cases, an operator's incentive to invest will depend on the additional returns it expects to make (i.e. the incremental returns that can be attributed to the extra investment). These returns will be affected by the degree of competition which the firms face in the market. On the one hand, greater market concentration resulting from a merger can be expected to increase the returns a firm might anticipate from new investments, since it will have fewer rivals to share these with or who will compete them away. This is referred to as the 'Schumpeterian effect' and leads to higher investment. On the other hand, greater market concentration may mean that a firm has a weaker incentive to 'escape competition' by investing to get ahead of its rivals. This is because the incremental benefits from such an investment compared to current returns may be smaller in a more concentrated market. This suggests that less investment will take place and explains why competition authorities often claim that mergers will not incentivise companies to invest.

7.

Most economists would agree that we can make general assertions about which one of these various incentives may ‘dominate’ when there are very significant differences in the level of competition. For example, most (though not all) economists would agree that monopoly provision of most services would produce lower investment than competitive provision⁸. But the

position is more difficult if we consider smaller differences in the level of competition, as we might find when comparing a four player with a three player mobile market. We are not aware of any theoretical or empirical basis for determining whether the ‘escape competition’ effect will in general be expected to be stronger in three player markets than the ‘Schumpeterian’ effect.



However, we have reviewed empirical evidence in an attempt to assess the impact of competition on the level of investment by undertaking a cross-country analysis to assess whether investment levels (as measured by both capex/sales ratios and by capex/subscriber ratios) are higher or lower in three player or four player mobile markets.

We intend to undertake some further analysis of the impact of competition on investment levels. However, our conclusion at this point is that competition authorities and merging parties should

- (i) not assume that a four-to-three mobile merger is likely to reduce levels of investment simply because there will be one fewer player in the market (i.e. the ‘multi-lateral’ effects debate), and*
- (ii) focus instead on the impact that the merger in question could have on the unilateral investment incentives of the combined entity.*

8. Aghion et.al. (2005) suggested that the link between innovation and concentration may exhibit an inverted U-shape, depending on which of the two effects dominates. “Competition and Innovation: an inverted-U Relationship” (Aghion, Bloom, Blundell, Griffith and Howitt 2005).



A merger may accelerate the roll-out of new technologies

The UK case

After the merger between Orange and T-Mobile in the UK in 2010, the merged entity, Everything Everywhere (EE), announced a £1.5 billion investment into their 'Network Evolution Programme'⁹ to upgrade their existing hardware and prepare for the new 4G roll-out.

The merger allowed EE to roll-out LTE faster than either Orange or T-Mobile would have been able to do absent the merger. This was because EE had sufficient spectrum holdings at 1800MHz to launch LTE before the auction of further spectrum (in the 800 MHz band). Today, EE remains the market leader in LTE, both in terms of subscriber numbers and population coverage (in March 2014, EE already had 73% population coverage compared to 41% for O2 and 36% for Vodafone)¹⁰. EE's investments in LTE have prompted its rivals to roll-out 4G as quickly as possible, with both Vodafone and O2 aiming to have 98% population coverage by the end of 2015. In October 2014, EE became one of the first operators in Europe to launch LTE-Advanced services¹¹.

9. <http://www.coolsmartphone.com/2011/12/08/everything-everywhere-announces-massive-network-investment/>

10. http://stakeholders.ofcom.org.uk/binaries/research/cmr/cmr14/UK_5.pdf

11. <http://www.fiercewireless.com/europe/story/ee-launches-lte-advanced-services-london-reaches-6m-lte-users/2014-10-31>

The available evidence is not consistent with the hypothesis that four-to-three mobile mergers should in general be expected to lead to higher prices

The greater significance of dynamic efficiencies from investment in technology in mobile markets (compared to many other sectors of the economy) suggests that particular attention needs to be paid to the impact that mergers may have. Mergers impact on the ability and incentive of operators to invest, both in terms of investment in existing technologies within the technology cycle and in terms of the capacity of the market to move from one cycle to another.

Empirical evidence suggests GUPPIs do not capture appropriately mobile market dynamics.

In recent cases, competition authorities in both Europe and the United States have used an analytical framework known as the Gross Upwards Pricing Pressure Index (GUPPI) analysis to predict what might happen to unit prices in mobile markets following mergers. In these cases, this type of analysis often (but not always¹²) predicts of very large price increases. For example, in Germany, the Commission predicted price increases of 26% to 37% in the prepay segment¹³ and, in Austria, the Commission predicted price increases of 10% to 20% in the post-paid segment^{14 15}.

12. In Ireland, the Commission predicted price increases of 6% in the post-paid sector and 4% market wide – see: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.C_2014.264.01.0006.01.ENG

13. <http://www.telecompaper.com/news/ec-fears-price-increases-from-o2-e-plus-merger-report--999139>

14. http://ec.europa.eu/competition/mergers/cases/decisions/m6497_20121212_20600_3210969_EN.pdf

15. In both countries, the Commission just calculated a combined predicted price increase for both merging parties, rather than separate predicted price increases for each party.

If the Commission applied these same tools to other European markets where four-to-three mobile mergers are conceivable, then it would likely find GUPPIs of greater than 10% in over 85% of cases¹⁶. GUPPIs will always predict that prices will increase after a merger occurs in a market. The implication of GUPPI analysis is that prices in three player mobile markets are systematically and consistently higher than in four player markets. We would also expect to find that prices fall less rapidly in three player markets than in four player markets, as the degree of pass through of cost reductions is in general expected to be greater with more intense retail competition.

We have therefore conducted an extensive empirical investigation of how prices for voice services differ in three and four player markets over a 14 year period, using data from the GSMAi's database. We use average revenue per minute as our measure of prices¹⁷, as Average Revenue Per User (ARPU) fails to take into account differences in usage¹⁸. Both a graphical analysis and a more sophisticated statistical analysis (using econometric techniques to control for other factors which might be expected to affect price outcomes¹⁹) demonstrate that there is no evidence that prices are systematically lower in four player markets than in three player markets. This is in stark contrast to the predictions of the GUPPI framework. This suggests that the GUPPI framework may treat the inputs that it relies upon incorrectly, and/or that it fails to consider

altogether other factors which influence unit prices in mobile markets. Of course, it also means that any suggestion that simply counting the number of mobile operators in a market can be a predictor of market performance is misplaced. We note that the Commission has recognised this, as it has stated that there is no "magic number" of mobile network operators and indicates that mobile mergers need to be approached on a case-by-case basis²⁰. In contrast, some regulators have taken a stance on the optimal number of mobile network operators (MNOs), which is reflected in the spectrum caps that have been used in auctions. For example, in the UK, Ofcom has explicitly stated that it considers that the mobile market needs a least four players and the FCC in the US has made similar statements.

16. This assumes a threshold of 10%.

17. This has been calculated as ARPU by connection divided by minutes of use per connection.

18. We have also repeated our analysis for ARPUs, which does not impact our result that prices are comparable in three and four player markets.

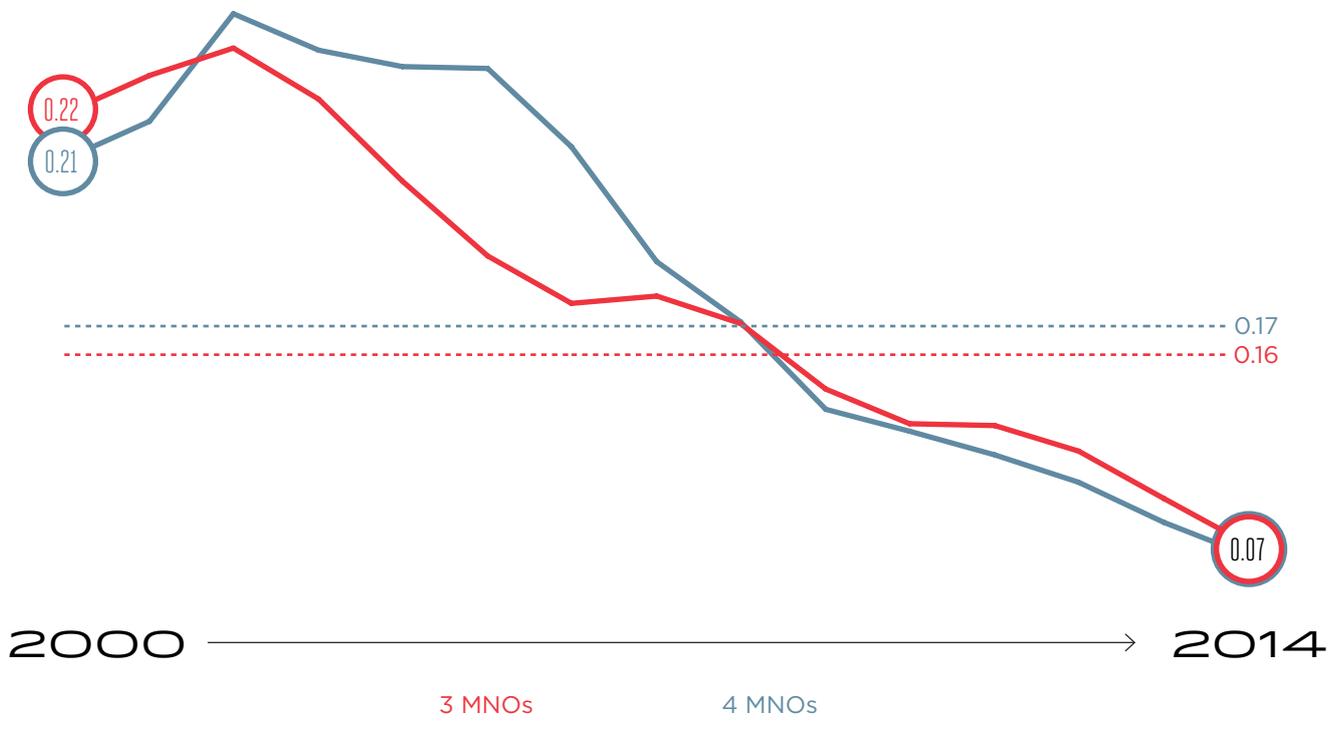
19. We have taken into account similar analysis undertaken by Telefonica, H3G and the Commission in the context of the recent merger proceedings in Ireland and Germany.

20. <http://ec.europa.eu/competition/publications/cmb/2014/CMB2014-01.pdf>

Figure 5

Prices in three and four player EU markets

Euros per minute



Source: GSMA intelligence

Notes: (1) we consider only those MNOs that have a market share of above 5%, and we do not include MVNOs (2) analysis does not include Cyprus, Estonia, Luxembourg or Slovakia due to lack of data availability (3) these prices are nominal (putting the data in real terms would not change the conclusions)

We have also assessed the available evidence on unit price trends in Austria, which has been the focus of intense attention following the merger of Orange and H3G²¹. Price increases of 10-20% were predicted in the post-paid segment.

In Austria, there have been claims that prices have indeed increased following the merger. This has led the Austrian competition authority (BWB) to launch an investigation into mobile retail pricing, the results of which have yet to be published. The claims appear to be based on pricing information published by the Austrian regulator (RTR). There are however a number of relevant considerations to take into account:

- the evidence relates to a short time period, whilst mobile market performance should be judged over a much longer time period. As indicated by Figure 5, the long-run pricing evidence that we have examined is not consistent with prices being higher or falling less rapidly in three compared to four player markets;

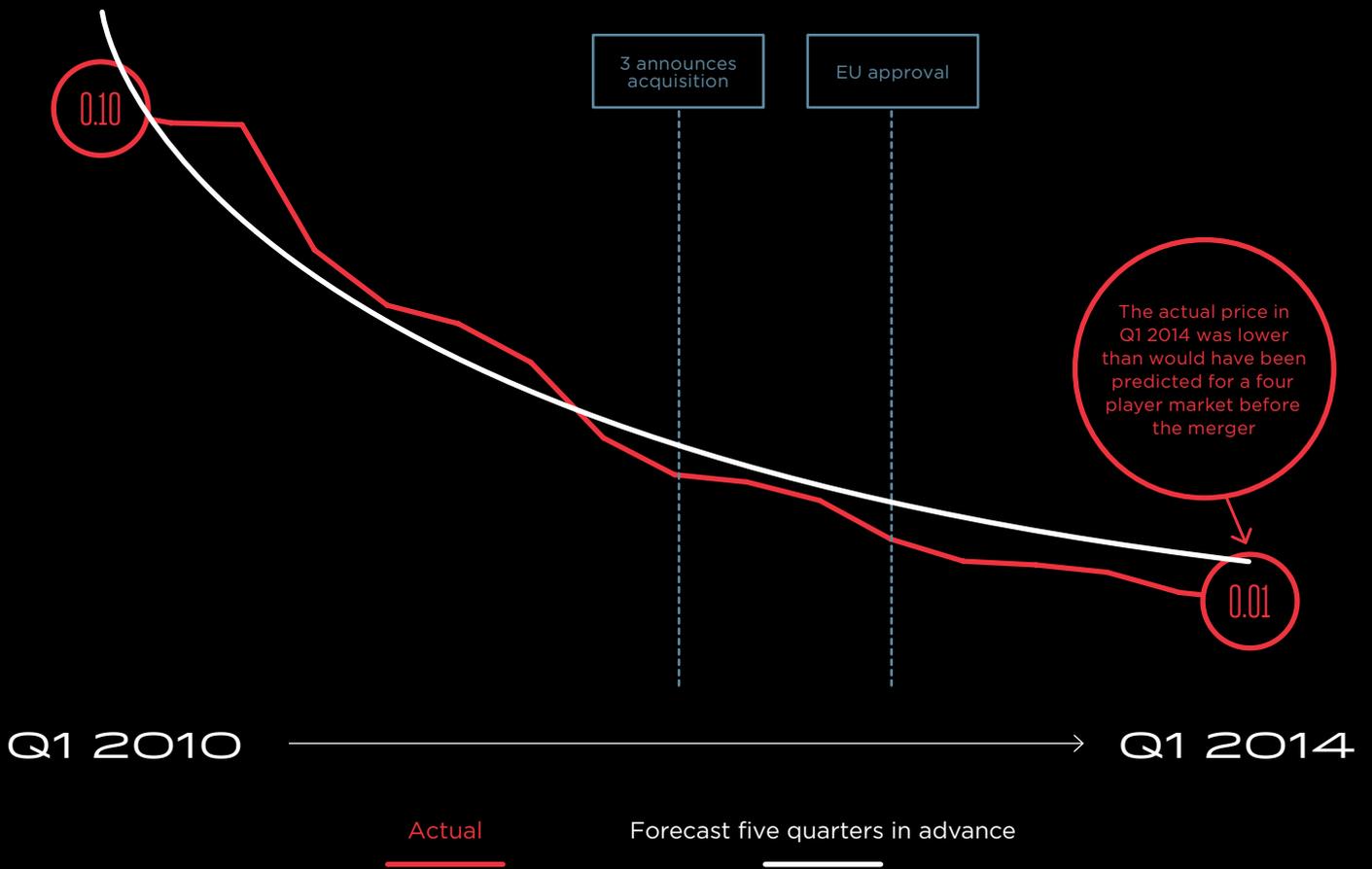
- the prices only relate to new tariffs with no indication of the take-up of these tariffs; and
- the different consumption baskets are getting larger over time to reflect increases in usage.

This noted, we have analysed the underlying data from the RTR on the Austrian mobile sector to assess trends in unit prices over time.

21. It is too early to assess the impact of the mergers in Germany and Ireland, and competition authorities did not undertake GUPPI analysis in the UK, Netherlands or Australia.

Figure 6

Price per average MB of voice, SMS and data in Austria



Source: RTR

Notes: (1) price calculated based on conversion factors of 12.2 kbps for 3G voice and 150 bytes for SMS, which is in line with what Ofcom used in its Mobile Termination Rate model (2) forecast based on a logarithmic trend (3) prices are in nominal terms.

Although we present results based on the RTR data available, we do not consider that any robust conclusions should be drawn one way or the other from the performance of the Austrian mobile market at this stage, although we do note that the period after the merger is of particular interest given that the remedies had not been fully implemented by this point.

What evidence we have on prices suggests no immediate grounds for concern but the impact of the merger on other dimensions of market performance, notably quality, innovation, speed of roll-out and therefore long term prices, would require consideration of the impact of the merger on investment across technology cycles. This is a task for a future study.

Reasons why GUPPIs are likely to overstate unit price effects of mobile mergers

There has been some debate already as to the limitations of the use of GUPPI analysis in the context of recent merger proceedings. In this section we present these, and consider also how the framework might be modified and improved in future²²:

- Efficiency gains and quality improvements.**
The standard approach to GUPPIs does not take into account that mergers may lead to unit cost reductions and improvements in the quality of services as a result of changes to investment incentives, as discussed above. ‘Hedonic’ GUPPIs²³ try to reflect quality improvements. We recognise however that data required to calculate such GUPPIs is challenging to obtain.
- Capacity constraints.**
GUPPIs rely on a particular model of competition (“differentiated Bertrand”), which assumes that there are no capacity constraints in the market. However, the mobile industry is facing rapid growth in data usage and scarcity of spectrum, which means that at least some operators are likely to face periods when they are running their networks close to full capacity. This will impact pricing decisions, but is not captured by GUPPIs used by competition authorities. In an extreme case where two operators that are operating at full capacity merge, the expected impact of the merger on prices would be zero. Similarly, if a merger expands the total capacity available to the market (for example, by changing investment incentives), this could lead to lower prices if operators were previously constrained.
- Re-positioning of operators.**
GUPPIs assume that the merging parties or rivals would not re-position themselves following a merger if the merging firm increases prices. The merging party will have to make a decision on how they position themselves post-merger, and whether to discontinue one of the brands. Further, if a segment of the market were to become particularly profitable (as the Commission has often suggested), then rivals would have an incentive and ability to target that part of the market more aggressively.
- Incorrect application of GUPPIs to narrow segments.**
In all recent merger cases, the Commission has defined a single retail market for mobile services, which includes both pre-paid and post-paid services²⁴. The Commission has however undertaken these GUPPI analyses by applying them to particular groups of customers or ‘segments’ within the overall mobile market. The consequence of this is that the GUPPI predictions for particular segments, even if correct, may not be a good indicator of how the market as a whole will behave post-merger (and may overstate concerns about prices).

22. The proposals relate to modifications which would be likely to produce price predictions from the GUPPI framework when considering four-to-three mergers that are more consistent with the evidence presented earlier. We do recognise that there are also other factors that a basic GUPPI framework does not take into account that could potentially lead in the opposite direction (e.g. the incentives of the non-merging parties to raise prices after the merging parties do).

23. Considering hedonic prices (quality adjusted prices) after the merger would take into account that the overall value of a product may increase if quality increases at a given unit price.

24. <http://ec.europa.eu/competition/publications/cmb/2014/CMB2014-01.pdf>

In addition to the above, results will be affected by the way in which competition authorities consider the margins used in the GUPPI analysis. Authorities typically assume that a large proportion of a mobile operators' costs are fixed, which produces high variable margins. The higher the variable margin, the higher the predicted price increase in a GUPPI framework (as after the merger an increase in price by one of the merging parties will be more profitable if subscribers switch to the merging rival).

However, in reality, mobile operators are facing rapid growth in data usage and are constantly investing in their networks²⁵. A much greater proportion of network costs are likely to be variable over the short- to medium-term than in other network industries. Taking this properly into account would lead to lower margins and therefore lower predicted price increases. The average margin in the EU, measured as EBITDA minus capex, is 10.9%. We acknowledge that a proportion of capex and some of the operating costs used to calculate EBITDA will be fixed, even when considering a longer time period. However, the calculated margin still suggests that a more accurate measure of gross margins could be considerably below the 60% to 80% range typically used by the Commission. As the GUPPI is directly proportional to the margin used, a material reduction in the margin will have a significant impact on the calculated GUPPI.

Competition authorities' calculations of margins generally rely on historical data from the markets in question. However, historical margins may not be a good predictor of future margins because the growth of Over-The-Top (OTT) players such as WhatsApp and Skype could be expected to affect the intensity of competition for some of the services offered by mobile operators (e.g. SMS).

25. As we have explained, the mobile industry has important technology cycles. However, even once a new technology has been rolled-out, operators will still need to invest in their networks to increase capacity.

The role of mavericks may be less significant in future

Competition authorities have also tended to place a considerable emphasis on the role of ‘mavericks’ or new entrants in driving mobile market performance when undertaking merger analysis²⁶. Many of these operators entered European markets at the beginning of the 3G technology cycle in the early 2000s, although there are exceptions such as the recent entry by Free in France²⁷. There was considerable optimism about the prospects for new mobile operators at that point in time. Since then, many have struggled to earn a sufficient return on the investments they have sunk as the outlook of the mobile sector has worsened and they have faced challenges in achieving minimum efficient scale²⁸.

These ‘mavericks’ now face another investment and technology cycle, as mobile markets transition from 3G to 4G. The available

evidence suggests that at least some of them are considering alternative strategies, such as scale through mergers and withdrawing from competing in 4G. For example, Hutchison, one of Europe’s leading ‘mavericks’, has pursued mergers in Ireland and in Austria. Also, as shown by the following table, some ‘mavericks’ were also unwilling to pay the required prices to acquire 800MHz spectrum in the recent wave of auctions, suggesting that their role in 4G competition may be limited or may presuppose a merger with an operator that holds such spectrum. If ‘mavericks’ change their behaviour, then prices absent a merger could also be expected to fall less rapidly in the future compared to the past. We also note that there are very few ‘4G’ entrants in Europe who do not already have 3G operations.

Table 1

‘Mavericks’ failing to acquire 800MHz spectrum

Country	‘Maverick’ operator	800MHz auction outcome
Austria	3 Hutchison	Did not secure 800MHz spectrum in the auction
Croatia	Tele2	Did not bid for spectrum
Denmark	3 Hutchison	Did not secure 800MHz spectrum in the auction
France	Free	Did not secure 800MHz spectrum in the auction
Ireland	3 Hutchison	Did not secure 800MHz spectrum in the auction
Italy	3 Hutchison	Did not secure 800MHz spectrum in the auction

26. See for example <http://ec.europa.eu/competition/publications/cmb/2014/CMB2014-01.pdf> page 12

27. We note however that France was the only major EU country with three MNOs until the entry of Free.

28. Such that the firm makes operating profits and begins to recover its historical investments



Network sharing cannot be expected to deliver the same benefits as a merger

Competition authorities have often argued that network sharing represents a preferred alternative to mergers, because this leave competition at the retail level unaltered²⁹. This view is based upon the unsupported assumption that four-to-three mobile mergers should in general be expected to lead to higher prices which, as explained previously, is inconsistent with the available evidence. This means the case for a generalised preference of network sharing over mergers is substantially weaker.

Network sharing is also likely to be an inferior alternative to mergers if the unilateral investment incentives created by the merger are strong. In these circumstances, network sharing is likely to result in lower incentives to invest than mergers. The reason is straightforward: under a network sharing deal, it would in general³⁰ be more difficult to obtain competitive advantages from incremental network investments because any gains will be expected to be shared with or competed quickly away by the network partner³¹. On the other hand, a merged firm will be less exposed to this mechanism and should therefore be expected to have greater unilateral incentives to invest as a result.

29. This is the view expressed in a recent OECD study (OECD (2014), "Wireless Market Structures and Network Sharing", OECD Digital Economy Papers, No. 243, OECD Publishing)

30. This will depend on the nature of the network sharing deal. The type of network sharing deal that would be 'equivalent' to a merger would be expected to involve sharing of the majority of radio access network (RAN) assets, and hence have the effect described in the text. A network sharing deal that involved only a small share of RAN assets would not be an appropriate counter-factual to a merger.

31. The speed at which the benefits are competed away will depend on the state of competition in the retail market and the strength of competition from other players.

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There are also other considerations when assessing network sharing as an alternative to mergers that need to be taken into account:

- **Lower potential benefits.** Network sharing will not deliver benefits at the retail-level that result from mergers (e.g. by rationalising sales channels). Further, although there are many types of network sharing agreements, many of these only involve site or tower sharing agreements. This means that the benefits at the network-level from such agreements will be significantly lower compared to a merger in which all assets are combined (which also benefit from economies of scale).
 - **Slower and reduced investment.** Under a network sharing agreement, the pace and scale of investment will generally be dictated by the party with the lowest incentive and ability to invest. Although this may still result in benefits compared to no sharing, it will produce lower benefits than under a merger in which one party has full control.
 - **Execution risk.** Although mergers are also risky, a merger allows a firm to control a core asset, the network, whilst network sharing means that the firm has to assume the risk of dealing with a partner that it cannot control who is also a competitor. Given the importance of the network, and the significant degree of uncertainty about the future in a market characterised by rapid technological change, this risk is significant. This is often why lower level (site and tower) sharing agreements are preferred.
 - **Time-limited and uncertainty.** Network sharing deals will typically only last for a certain length of time, which may limit the amount that operators are willing to invest in the period. There could also be a concern that the agreement could break down, which may further reduce investment incentives.
 - **Difficulty of reaching an agreement.** It may be difficult for operators to reach a network sharing agreement, particularly for more extensive forms of network sharing. This is particularly the case if operators are likely to benefit from the agreement in an asymmetric way. It could also be the case that the operators have different spectrum holdings or different deployment strategies.
- These issues need to be assessed on a case by case basis but, based on the evidence presented in this report, there does not appear to be any reason to be more confident about, or to attach greater weight to, the (net) benefits of network sharing compared to the benefits of a four-to-three merger. On the contrary, the benefits of network sharing may often be more speculative than those that can be attributed to mergers. Particular care should be taken when contrasting the benefits of network sharing against the benefits of a merger that promises to produce strong unilateral investment incentives.

Remedies may undermine the potential benefits from mobile mergers

In the recent mergers in Austria, Germany, Ireland and the UK, the European Commission has imposed specific conditions and remedies before allowing the parties to proceed. In many cases these arise from concerns, which we consider to be misplaced for the reasons explained above, that retail prices would otherwise increase substantially following the merger. If these concerns are indeed misplaced, then many of the remedies adopted by competition authorities will be misdirected.

These remedies required by the Commission have mainly focussed on spectrum divestment, MVNO access and network sharing deals. We recognise that there may be a case for imposing remedies to help alleviate any competition concerns from mobile mergers in particular cases, but it is important to ensure that the remedies do not produce unintended effects which undermine the benefits that might otherwise result from the merger. Inappropriate remedies could create the following issues:

- **Reduced investment incentives.** If a merger creates strong unilateral investment incentives, then competition authorities should take care to ensure that remedies do not undermine them. For example, if operators are then forced to provide access to their networks to third parties (such as MVNOs) as a condition of the merger, then this could reduce the benefits that operators can derive from a given investment³². If the terms on which access are granted are also onerous or subject to regulatory uncertainty, then this could further undermine investment incentives. Similarly, if the merger allows firms to aggregate spectrum and to invest in order to obtain first mover or other competitive advantages at the outset of a technology cycle, then any divestiture of spectrum (or other assets) is likely to undermine these incentives to invest³³.
- **Underutilisation of resources.** Remedies which involve reallocating network assets or reserving spectrum for other operators or potential operators mean that these resources are not available to the merged party to use. It will often take time to transfer these resources to the regulator or to other operators (since existing users will need to be migrated off them) and during this period there is likely to be limited ongoing investment in these assets and increasing underutilisation. This problem will be compounded if, as occurred in Austria, the assets are then reserved for future entrants who do not emerge. During this period, valuable assets lie unused. The Commission itself recognises that “if competitors have sufficient spectrum to compete before the merger and these spectrum holdings allow them to compete effectively after the merger, then the mere fact that the merger increases the merged entity’s spectrum is not likely to give rise to competition concerns”³⁴. Given this, it is not clear that spectrum divestment is necessary in many cases. Obligations to reserve capacity on networks for MVNOs may also lead to that capacity being unused if demand fails to arise.

32. This is similar to the case of network sharing, where benefits of investment will also be shared.

33. Note that the European Commission did not require spectrum divestiture in Ireland (although MVNOs retain an option to call on certain spectrum at a later date) or Germany

34. <http://ec.europa.eu/competition/publications/cmb/2014/CMB2014-01.pdf> page 12



We do not suggest that remedies may never be appropriate in mobile mergers or that consumer benefits cannot be obtained by approving mergers with conditions rather than blocking them outright. This will depend upon the facts of each case. However, remedies should be internally consistent and informed by a clear understanding of how mobile markets function and what drives performance. *This study suggests that by working with mobile operators and developing a better understanding of the relationship between competition and investment, competition authorities could achieve better results for consumers than they have done in the past.*

This briefing report has been produced by Frontier Economics at the request of the GSMA. It summarises the key findings of a longer report which the GSMA expects to publish early in 2015. The GSMA welcomes comments and feedback on the contents of this document to ensure a fair and balanced view of the current landscape. To register to receive the full report in early 2015, or to comment on this report, please email publicpolicy@gsma.com.



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