



Assessing the case for in-country mobile consolidation in emerging markets

A report prepared for the GSMA

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ASSESSING THE CASE FOR IN-COUNTRY MOBILE CONSOLIDATION IN EMERGING MARKETS

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Executive Summary

Mobile services in less developed economies, or 'emerging markets', over the past decade have witnessed remarkable growth. Billions of users, who do not otherwise have access to many of the facilities and services available to citizens in the developed world, have nonetheless been able to gain access to mobile networks and technologies on affordable terms. As in the developed world, mobile networks in a number of emerging markets have been deployed as Governments have opened up mobile markets to more competition, by granting new licences and allocating new spectrum to mobile services.

Given the variation in socioeconomic and geographic factors in emerging economies, the evolution of mobile markets in such economies has also varied. This implies that the structure of mobile markets and the stage of their development can be very different across emerging markets, which also affects the need for mobile consolidation. The majority of emerging markets, however, have three or four national players – as in Europe or the US – and in some of these countries there is likely to be an increasing demand for further mobile consolidation in the future. The authorities in these countries are therefore likely to be faced with the question of whether to allow a reduction in the number of operators through mobile mergers.

This study was therefore commissioned by the GSMA to consider the question of, under what circumstances, a reduction in the number of mobile operators in an emerging market might benefit consumers and how, therefore, the public authorities in those markets should approach such proposals. In most cases, although a mobile merger will typically be proposed by privately owned mobile operators, it will require review by, and consent from, the relevant public authorities. This situation is similar to that found in Europe

and the US, where the public authorities have also recently reviewed a number of mobile mergers. Frontier Economics has undertaken a study of the issues arising in relation to mobile mergers in Europe, the results of which have also informed this study.¹ That said, conditions in emerging markets can differ significantly from those found in more developed markets, as well as differing significantly between themselves. Our findings and recommendations are based upon a review of mergers in a selected group of emerging markets, but may not apply to others. They are intended to provide a proposal for basic elements of an evaluation framework for public authorities in emerging markets to consider mobile mergers. The answers will however depend upon the circumstances of a particular case.

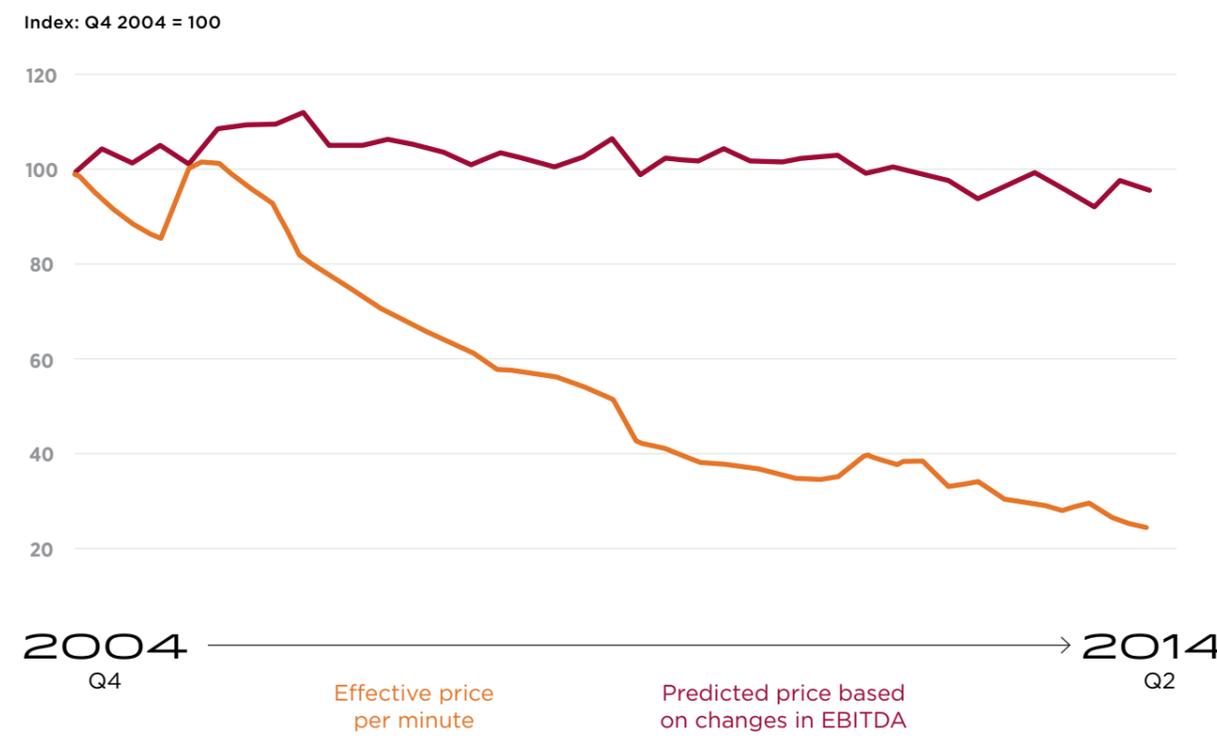
The GSMA has asked us to consider mobile mergers that have taken place in recent years in Chile, Argentina, Uganda and Indonesia. These were either 5-to-4 or 4-to-3 mergers. We also consider an attempted mobile merger in El Salvador that was blocked.²

In all of these cases, public authorities have been concerned that the merger could lead to higher prices for consumers. In doing so, they have tended to focus more on short-term price effects, whilst taking different views on the likelihood of efficiency gains as a result of a merger. However, the mobile industry is characterised by frequent technology cycles, with each new generation of technology delivering a significant increase in speed and capacity. This drives reductions in the costs of delivering services which in turn lead to lower prices and increases in demand and volumes. Empirical analysis suggests that it is these dynamic efficiencies arising from investments in new mobile technologies that have been by far the most important driver of price reductions in emerging markets over the last 10 years.

This is shown in Figure 1 below, which compares trends in (unit) prices with trends in industry profits across around eighty emerging markets, with the latter being an indicator of changes in competition over time (as profits might be expected to fall if new competitors enter the market, with all else equal). The data shows

that prices have fallen far more than changes in profits or competition might have been predicted to over the period. This suggests that the main driver of lower prices has been investment in new technologies, which led to increases in the volumes of mobile services consumed and improvements in the networks.

Figure 1
Unit price reductions in emerging markets are driven by dynamic efficiencies due to technological change



Source: Frontier Economics based on GSMA Intelligence

There are several distinct ways in which consumers in emerging markets could benefit from investments in both existing and new technologies. Some consumers still do not have a mobile phone or do not have mobile coverage in their areas. Even in those areas with coverage where consumers do have mobile phones, a relatively small proportion of these connections will be 3G connections, let alone 4G connections.

Given that many consumers in emerging markets do not have access to fixed lines or fixed broadband, expanding the mobile network or upgrading it could have a particularly strong impact on consumer benefits.³ Ensuring that the industry structure supports investment in mobile markets seems, therefore, to be a particularly important aim for policy makers in a number of emerging markets.

1. See <http://www.gsma.com/newsroom/press-release/gsma-report-highlights-benefits-of-mobile-mergers/>
 2. It should be noted that the our sample of case study countries is not representative of all emerging markets and that the choice of countries was mainly driven by the timing of the merger proceedings and the availability of information in the public domain.

3. For example, a study for the World Bank found that a 10% increase in mobile penetration yielded an additional 1.60 percentage points of GDP growth in high income countries and 1.81 percentage points in low and middle income countries (Qiang et al., 2009).

Mergers and investment

Mobile mergers could help to encourage investment in a number of ways. Many of these considerations apply to both developed and developing markets, but the benefits to be derived from mergers in emerging markets may sometimes be even greater:

- First, they can allow operators to benefit from economies of scale. Indeed, this is likely to be particularly important in emerging markets, given that average revenues are typically lower than in more developed markets. This means that more subscribers may be needed to recover network costs. With greater economies of scale, operators will have a greater incentive to invest in both coverage and capacity, as it is more likely that they will be able to make a sufficient return on such investments. Investments in capacity will improve the performance of the networks and proportion of calls completed, which can be a significant issue in some emerging markets.
- Second, mergers may provide operators with greater spectrum holdings in markets where spectrum may otherwise be relatively scarce. This may make it more feasible to launch new technologies due to spectrum aggregation.

In order to test these assumptions, we have carried out cross-country empirical analysis of the impact of market concentration on investment in 80 emerging markets, over the past 15 years. Our results show that by controlling for other factors that might affect investment, the concentration of

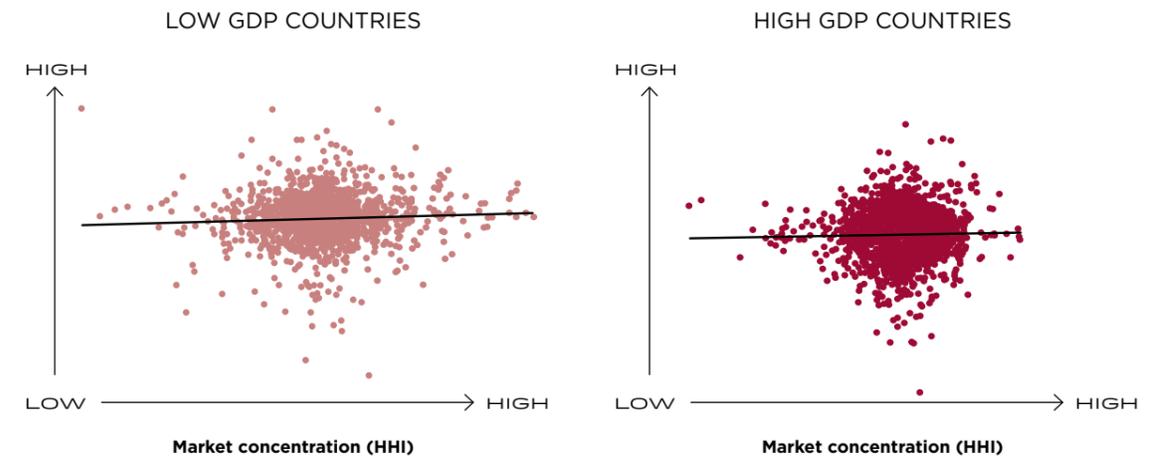
Spectrum and network equipment is, to some extent, substitutable so greater spectrum holdings may reduce the costs of expanding into new areas, and thereby increase coverage.

- Third, partnerships with other industries are likely to be particularly important in some emerging markets. For example, a significant number of people in emerging markets do not have traditional bank accounts but have access to a mobile phone. As a result, mobile banking has come to play an important role in several emerging markets. Allowing mobile operators to merge may improve their incentive to invest in such services or their ability to partner with others, to the benefit of consumers.
- Fourth, some operators in emerging markets may be cash constrained. It may be more difficult to gain external financing due to, for example, their relatively small size or greater uncertainty. In such situations, operators may already have an incentive to invest, but their ability to do so may be constrained. If mergers provide the operators with access to greater financing this may allow them to increase their investments.

the market (i.e. the presence of fewer operators, as measured by the Herfindahl-Hirschman Index (HHI) should not be expected to negatively affect investment (as measured by capex per subscriber), as shown in Figure 2 below.

Figure 2

Higher market concentration does not lead to less investment in emerging markets



Source: Economics based on GSMA Intelligence

Mergers and prices

We have also carried out an empirical cross-country analysis of the impact of the level of competition on prices in 74 emerging markets over the past 15 years. These include markets with more than five players, as well as markets with no more than two. The results of this analysis indicate that there is no clear link between market concentration and prices. This is consistent with results that we have obtained for developed countries. In some cases, there have also been concerns that a merger could lead to coordinated effects, meaning that the remaining players after

the merger may find it easier to jointly raise their prices and/or reduce their quality once there are fewer players in the market. This question will need to be answered by considering the specific facts of a particular market. Nonetheless, as noted above, the empirical evidence does not suggest that prices overall are higher in more concentrated emerging markets. There are many reasons why coordinated effects are unlikely in mobile markets at either the retail or wholesale level, and we consider these in more detail below.

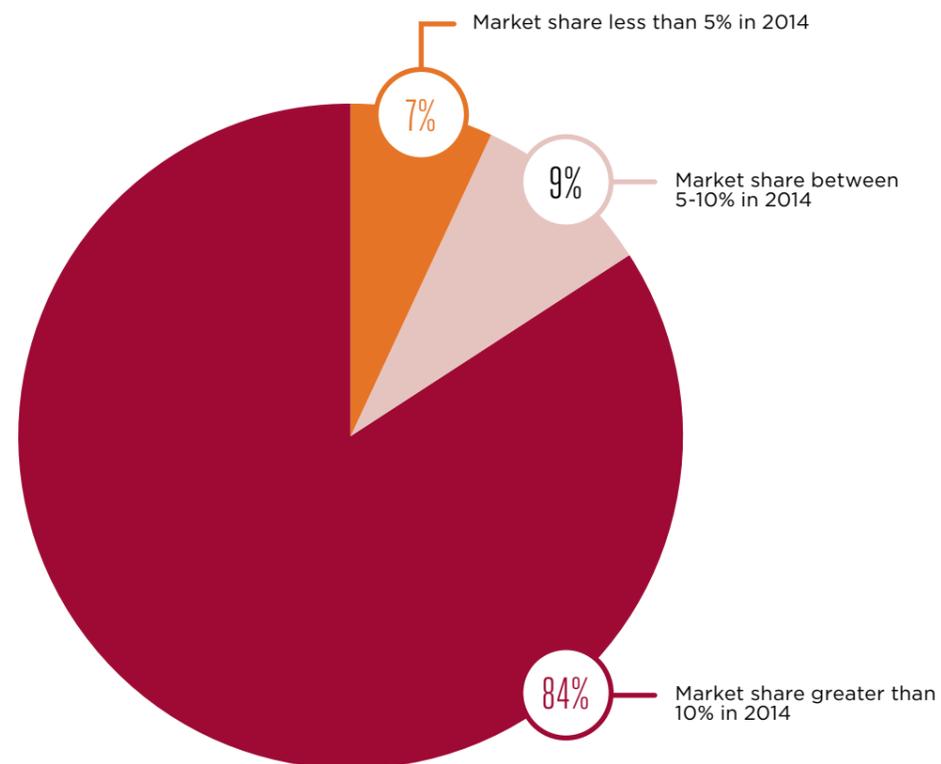
Small players

In El Salvador, the authority was concerned that one of the merging parties acted as a maverick in the market. Given the number of small operators across emerging markets, there are also likely to be future possible mergers involving a smaller player.

Such players may be willing to compete aggressively in the short-term to build up market share. However, in the longer-term, they may find it difficult to compete if they do not have sufficient scale and are struggling to make a return on their investment. Empirical evidence

from emerging markets shows that of the operators that had a market share of less than 5% in 2009, only 16% have now managed to achieve a market share of more than 5%, as shown in Figure 3. Indeed, 25% of the operators that had a market share of less than 5% in 2009 have since left the market. It therefore appears that many operators that have not grown beyond 5% have not earned a sufficient return on their investments in 2G and/or 3G technology. Some may find it difficult to contemplate further investments in 3G or 4G unless they pursue a merger in order to obtain greater scale.

Figure 3
Operators in developing markets with less than 5% market share in 2009



Source: Frontier Economics based on GSMA Intelligence

Note: analysis based on a sample of 59 countries with at least one operator that had a market share of less than 5% in 2009. In total, the sample includes 128 such operators.

Remedies

In many of the merger cases that we have reviewed, the authorities have imposed spectrum divestment as a remedy before approving the merger. However, in light of the significance of investment in new technologies and dynamic efficiencies for the realisation of consumer benefits discussed earlier, and the importance of spectrum in realising these benefits, such remedies should be considered carefully. In some cases, spectrum divestment could actually undermine the investment benefits from the merger.

Instead, allowing operators to have a greater spectrum holding may increase their incentive to invest. Asymmetric spectrum holdings may also lead to greater incentives to invest, if operators find it easier to make investments that cannot quickly be matched by rivals. Divesting spectrum may also take time, as a buyer may need to be found and it takes time to clear spectrum. This means that the spectrum may be under-utilised whilst this is happening.

Key implications of our analysis

The key implications of our analysis for merger assessments in emerging markets are as follows.

- There is no evidence to suggest that more concentrated markets with fewer competitors will produce either less investment or higher prices, in either developed or less developed mobile markets. Determining whether a reduction in the number of competitors will have an adverse impact on consumers will therefore depend on the facts of the particular case in question.
- Investment has been the main driver of reductions in unit prices in emerging markets over the past decade (as well as increases in quality). Mobile mergers can enable and incentivise greater investment, particularly if operators currently face spectrum constraints or challenges in financing the expansion of their operations.
- The role of smaller players or recent entrants should be carefully analysed. Many such players have struggled to gain sufficient scale in emerging markets to invest across technology cycles. For these players, mergers may be the only alternative to exiting or limiting their services to those using older technologies.
- The available evidence is not consistent with prices rising because mergers allow for coordination at either the retail or the wholesale level amongst the players that remain.
- Any remedies aimed at re-allocating spectrum from the merging parties should be carefully considered, so that they do not deter investment or lead to under-utilisation.

1 Introduction

The development of mobile services in less developed economies, or ‘emerging markets’, over the past decade has been an extraordinary story.⁴ Billions of users who do not otherwise have access to many of the facilities and services available to citizens in the developed world have nonetheless been able to gain access to mobile networks and technologies on affordable terms. As in the developed world, mobile networks in emerging markets have been deployed using private capital, much of it from foreign investors, as Governments have opened up their markets to more competition by granting new licences and allocating new spectrum to mobile services.

4. We use the GSMA's definition of emerging markets.

Given the variation in socioeconomic and geographic factors in emerging economies, the evolution of mobile markets in such economies has also varied. This implies that the structure of mobile markets, and the stage of their development, can be very different across emerging markets, which also affects the need for mobile consolidation. Some emerging mobile markets are still at a relatively early stage of development, in which the entry of additional mobile operators appears necessary to drive further development. Others, such as India, have created markets with many more operators than normally seen in more developed markets.

The majority of emerging markets, however, have three or four national players – as in Europe or the US – and in some of these countries there is likely to be an increasing demand for further mobile consolidation in the future. The competition authorities in these countries are therefore likely to be faced with the question of whether to allow a reduction in the number of operators through mobile mergers. This clearly poses a significant challenge to the prevailing view and experience of the past decade, during which users were seen to benefit greatly from the addition of more operators into emerging mobile markets.

In this section, we summarise the nature of the mobile industry in emerging markets and explain both why mobile mergers are likely to happen and why there is potential for them to have a beneficial impact on consumers. We also summarise competition authorities' recent thinking around five-to-four and four-to-three³ mobile mergers. We focus on mergers that have taken place in Chile, Argentina, Uganda and Indonesia, and a merger that was blocked in El Salvador. The rest of this section is structured as follows.

- in section 1.1, we outline the key features of the mobile industry in emerging markets;
- in section 1.2, we describe the approach that authorities in emerging markets have taken when assessing previous mobile mergers; and
- in section 1.3, we explain the structure of the rest of the report.

1.1 The mobile industry in emerging markets

Emerging markets have some particular characteristics which are important to consider when evaluating the case for consolidation. Below we highlight these characteristics and compare them across emerging and developed markets. We refer to many of these characteristics in subsequent sections of this report.

In the rest of this section, we explain that:

- many emerging markets have three or four players, so there is scope for future consolidation;
- consolidation may become increasingly common in emerging markets as coverage and take-up reach saturation point;

- there are more smaller players in emerging markets than in developed countries;
- emerging markets lag behind with innovations, but follow a similar technology cycle to developed countries;
- investment in mobile is particularly important in many emerging markets due to low fixed take-up; and
- players are more asymmetric in emerging markets than in developed countries, meaning that coordination is even less likely.

We conclude by summarising the implications of these characteristics for policymakers when considering merger cases.

1.1.1 Many emerging markets have three or four players, so there is scope for future consolidation

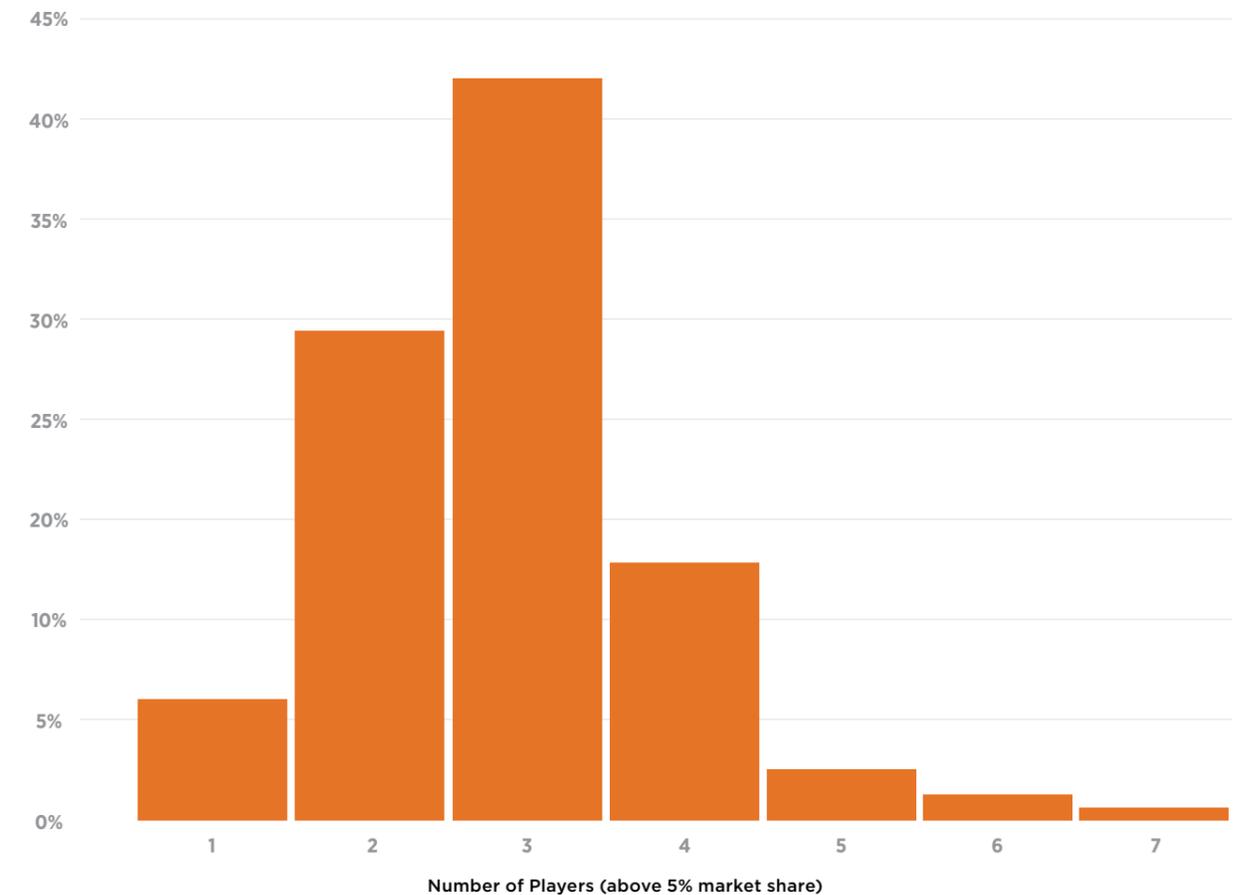
In emerging markets, there is considerable variation in the number of players that have been licensed, although most have licensed additional competitors in recent years. Some countries (mainly small countries) have only one mobile operator, whilst others, particularly those with players who only have coverage in a particular region (such as India, China and Russia),⁵ often have five or more regional players with a share of 5% or more of the national market each. Figure 4 illustrates this variation.

However, the majority of emerging markets have three or four players, as in developed countries. Several recent mergers in emerging markets have taken the number of players from five to four or from four to three (we discuss these in the next section), and we might expect this trend to continue in future as it has in developed countries (such as in Ireland and Germany).

Figure 4

There is considerable variation in the number of players across 150 emerging markets

Share of developing countries

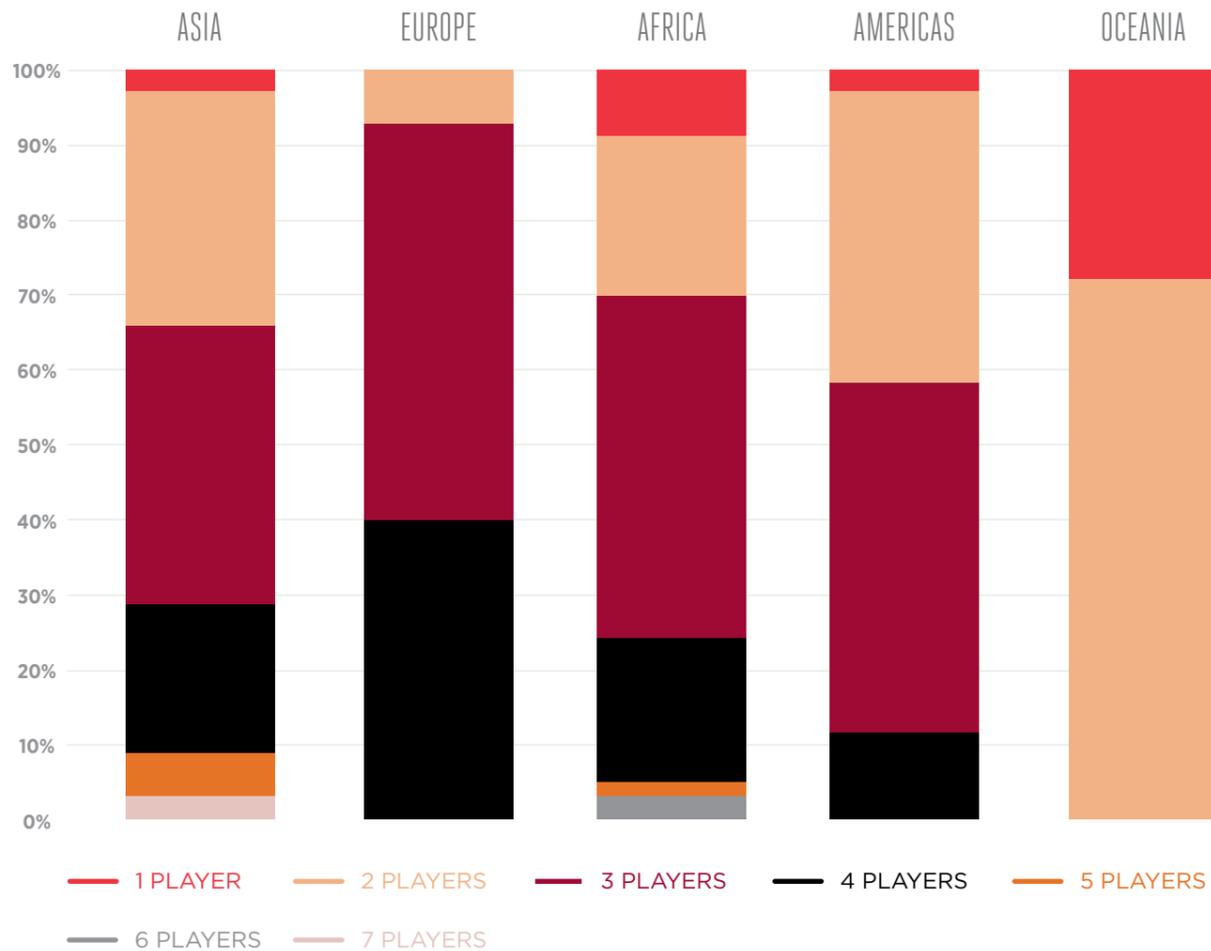


Source: Frontier based on GSMA Intelligence Q3 2014 data

Indeed, there are a significant number of emerging markets in most regions of the world with three or four players, as shown in Figure 5.

5. <http://www.cto.int/media/events/pst-ev/2014/CTO-Forum/presentations/Making%20ICT%20Affordable%20in%20Rural%20Areas.pdf>

Figure 5
Number of players in emerging markets by region



Source: Frontier based on GSMA Q3 2014 data

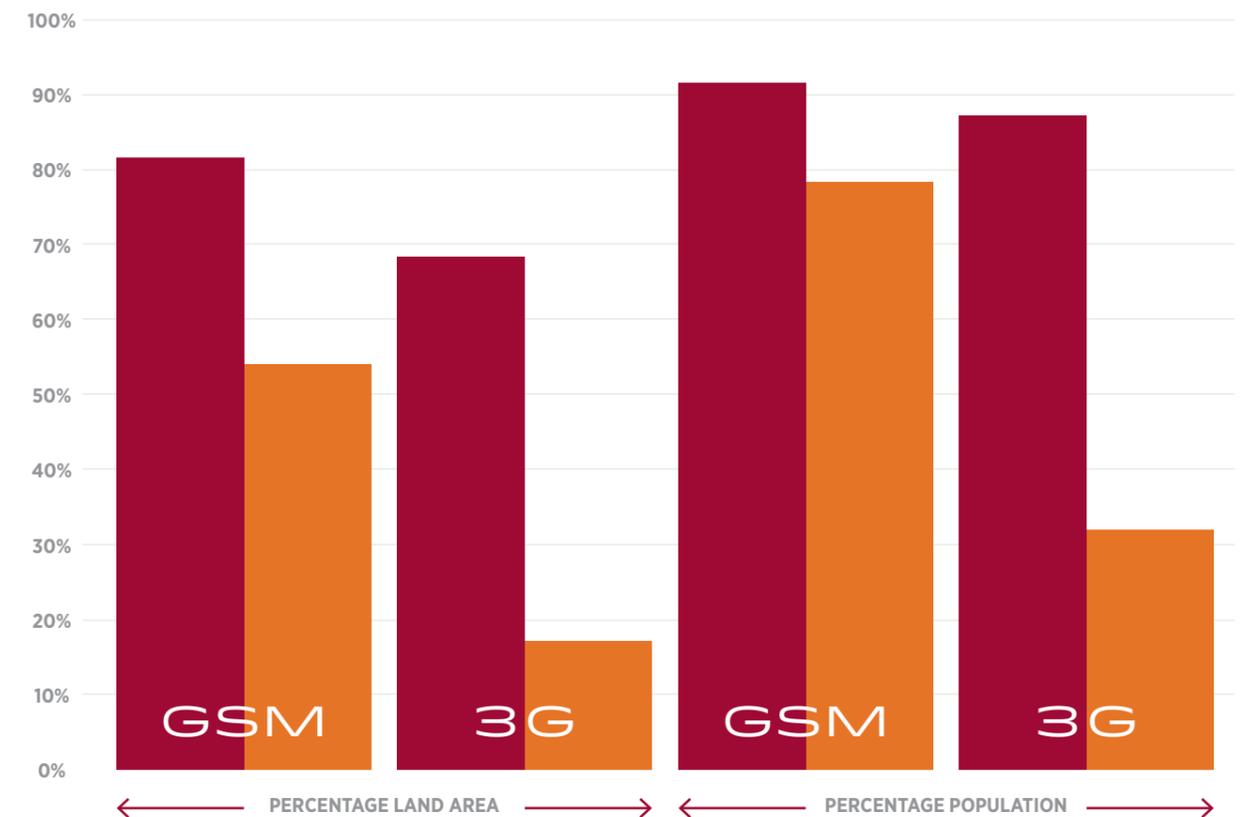
Note: Middle East countries are allocated to Asia. Emerging markets in Europe are Albania, Belarus, Bosnia and Herzegovina, Bulgaria, Kosovo, Latvia, Lithuania, Macedonia, Moldova, Montenegro, Poland, Romania, Russia, Serbia and Ukraine.

1.1.2 Consolidation may become increasingly common in emerging markets as coverage and take-up reach saturation point

Although the mobile industry has made remarkable progress in many emerging markets over the past decade, overall coverage and take-up of mobile services remains a much bigger issue in emerging markets than in most developed countries.

As Figure 6 shows, developed countries have, on average, considerably higher coverage of basic mobile services. There is an even starker contrast when more advanced technologies such as 3G are considered.

Figure 6
Coverage of land area is lower in emerging markets



Source: GSMA Intelligence

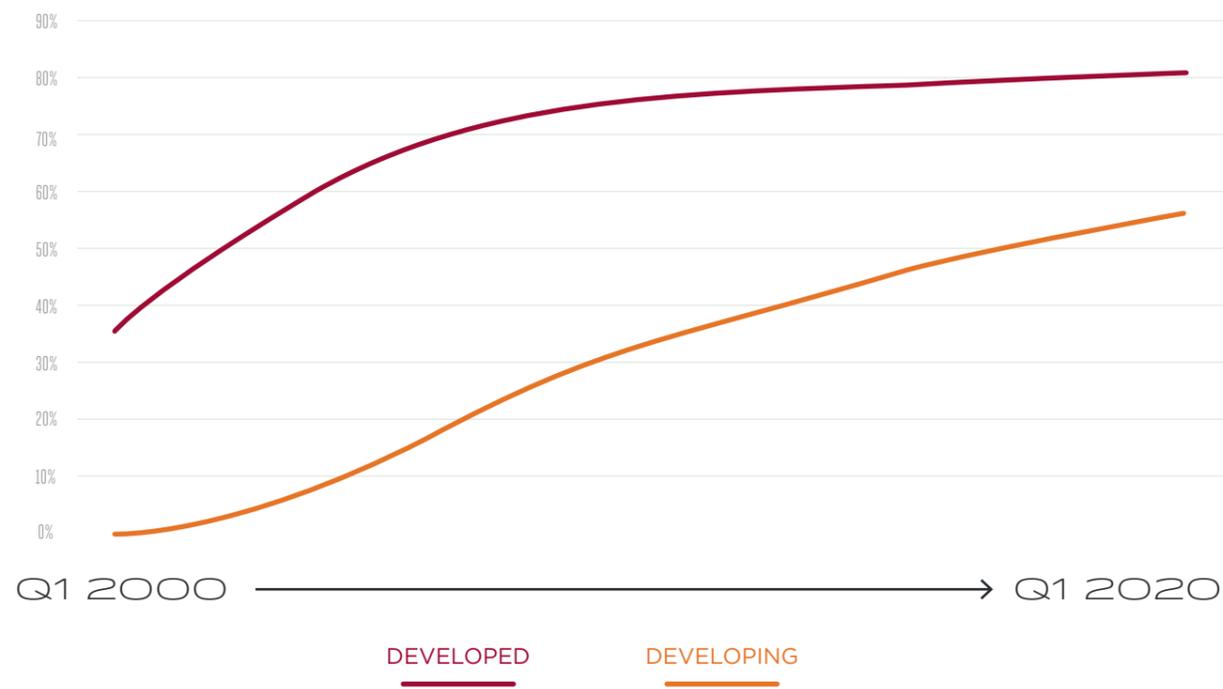
Note: This data source covers 80-140 emerging markets and 60-75 developed countries. The sample size varies due to missing observations from some countries for some of the measures of coverage.

In many emerging markets, the number of people using a mobile phone is still increasing, and the market is forecast to continue to expand for a number of years, as shown in Figure 7. In contrast,

most developed markets have now reached a saturation point where most people already own a mobile phone.

Figure 7
Overall take-up of mobile services

Total unique subscribers as a % of population



Source: GSMA Intelligence

This has important implications for the dynamics of mobile competition. In general, the period during which the market expanded and new subscribers could be attracted into the market was also associated with the entry of additional operators in the market. However, once markets become saturated and further growth requires operators to gain existing customers from their rivals, additional entry often becomes much more limited. Those operators that have already entered but have failed to obtain sustainable or profitable scale are often forced to reconsider their options.

This process can be accelerated if operators need to make another round of investments as the industry moves from one technology cycle to another. Although the growth of the market once encouraged entry, it may now force consolidation and mergers, particularly amongst smaller operators. This trend has been apparent in many developed markets for a number of years (as they move from 3G to 4G), but is also evident in some emerging markets today. In others, it may become evident in the years ahead.

1.1.3 There are more smaller players in emerging markets than in developed countries

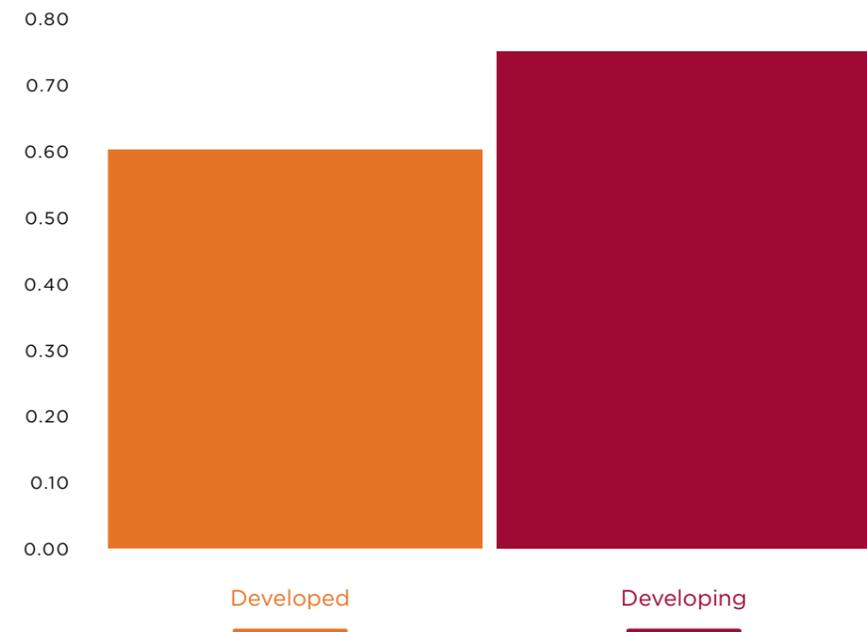
Although in both the developed and developing world, most countries do not have any players with less than 5% market share, these very small players are more prominent in emerging markets today.

In contrast, there is an average of 0.13 small players in developed countries. Equivalently, one in five emerging markets has a small player, compared to one in eight in developed countries. This is likely to reflect a greater degree of recent entry into emerging markets than developed markets.

Figure 8 shows that there is an average of just over 0.2 small players in each emerging market. In

Figure 8
The average number of small players is higher in emerging markets

Average number of small players per country



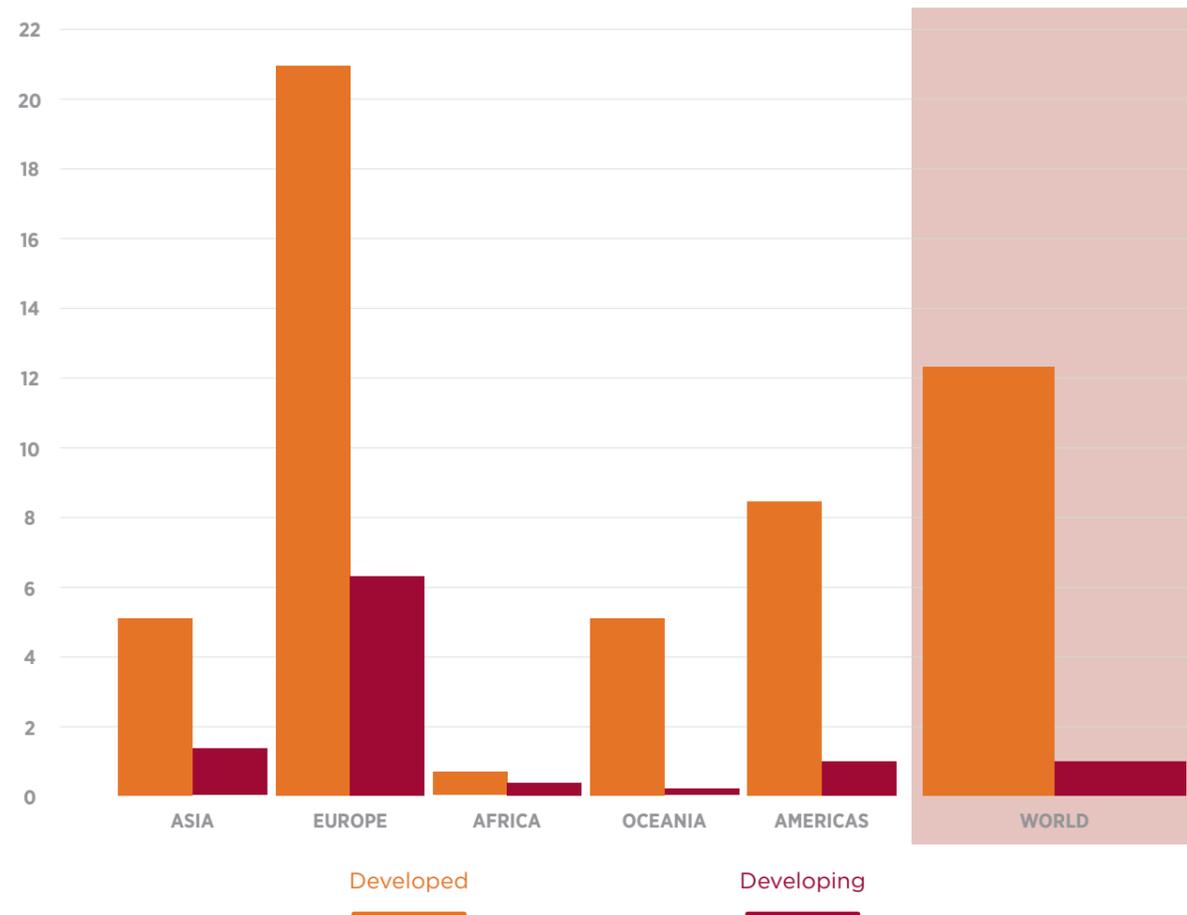
Source: GSMA Intelligence

In contrast, emerging markets consistently have fewer, if any, MVNOs than developed countries. This is often because entry by MVNOs would require a licence from the regulatory authorities in most emerging markets. But it is also notable that MVNO entry in many developed markets occurred only after markets had become relatively

saturated (typically 10-15 years after mobile services had first been launched). It is therefore possible that many emerging markets will follow the same trajectory, and that MVNO entry will become more common as retail markets mature in the years ahead.

Figure 9
Emerging markets have fewer MVNOs

Average number of MVNOs per country



Source: GSMA Intelligence

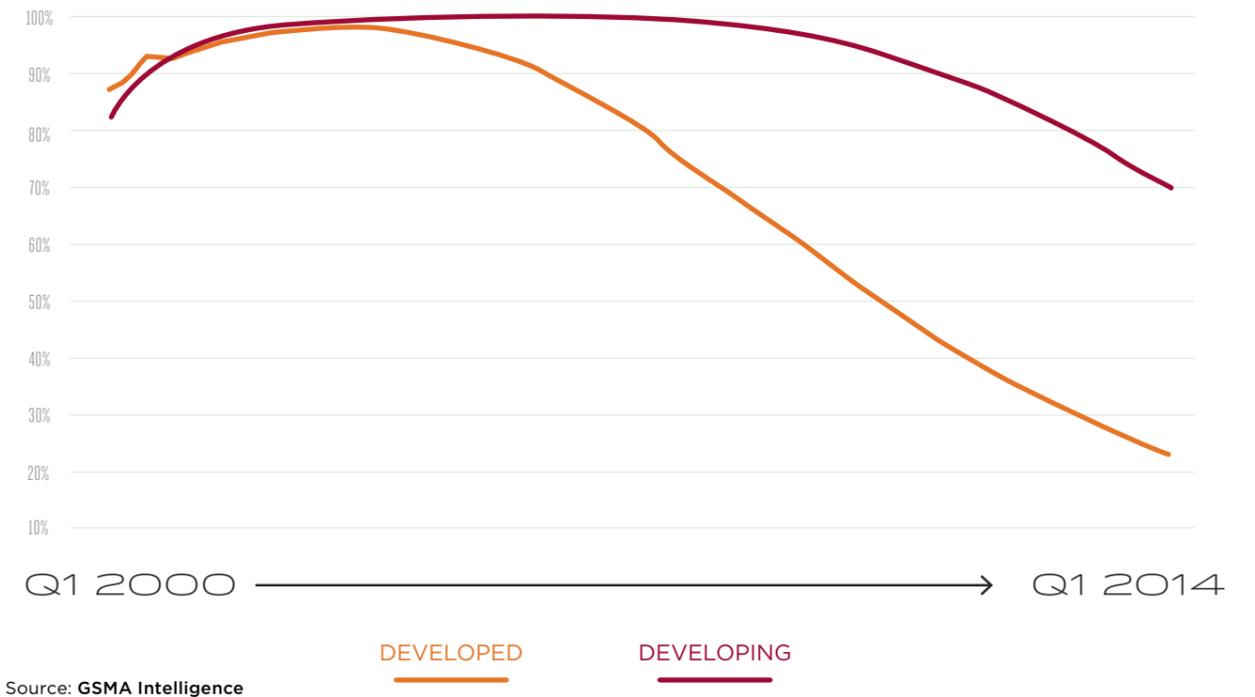
1.1.4 Emerging markets lag behind with innovations, but follow a similar technology cycle to developed countries

Emerging markets are lagging behind in the uptake of new innovations and services in the mobile sector. Developed countries have been considerably quicker to move from 2G to 3G services, and from 3G to 4G services. In particular, Figure 10 and Figure 11 suggest that emerging markets began moving towards 3G services

four or five years after developed countries. However, it appears that once new technology is introduced in emerging markets, uptake follows a broadly similar trend as in developed countries. This implies that emerging markets may follow a similar technology cycle to developed countries, but with a delay of a few years.

Figure 10
Emerging markets have been slower to switch away from 2G

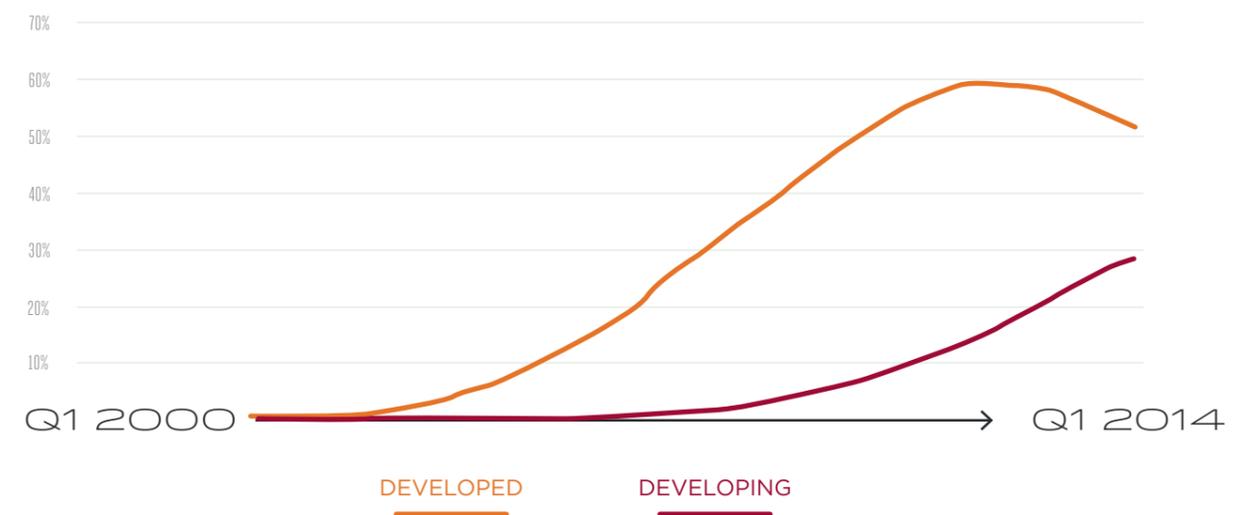
2G penetration (% of total connections)



Source: GSMA Intelligence

Figure 11
Emerging markets are still moving towards 3G

3G penetration (% of total connections)



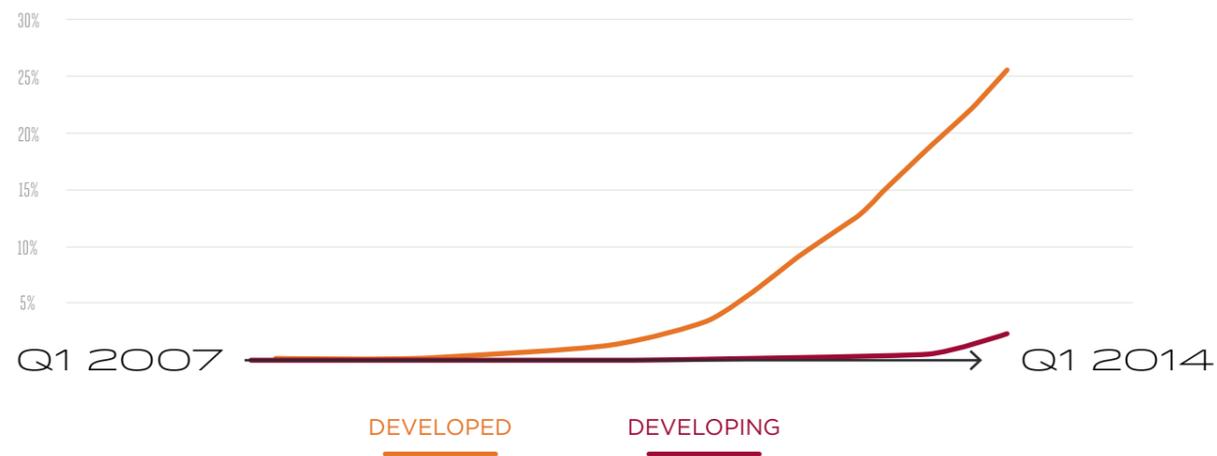
Source: GSMA Intelligence

This is consistent with recent trends in 4G take-up. Figure 12 shows that 4G take-up began around four or five years later in emerging markets compared to developed countries. Although 4G

services are relatively new to emerging markets, uptake trends appear to be similar to those in developed countries in the initial years after 4G was launched.

Figure 12
Emerging markets are only just starting to adopt 4G

4G penetration (% of total connections)



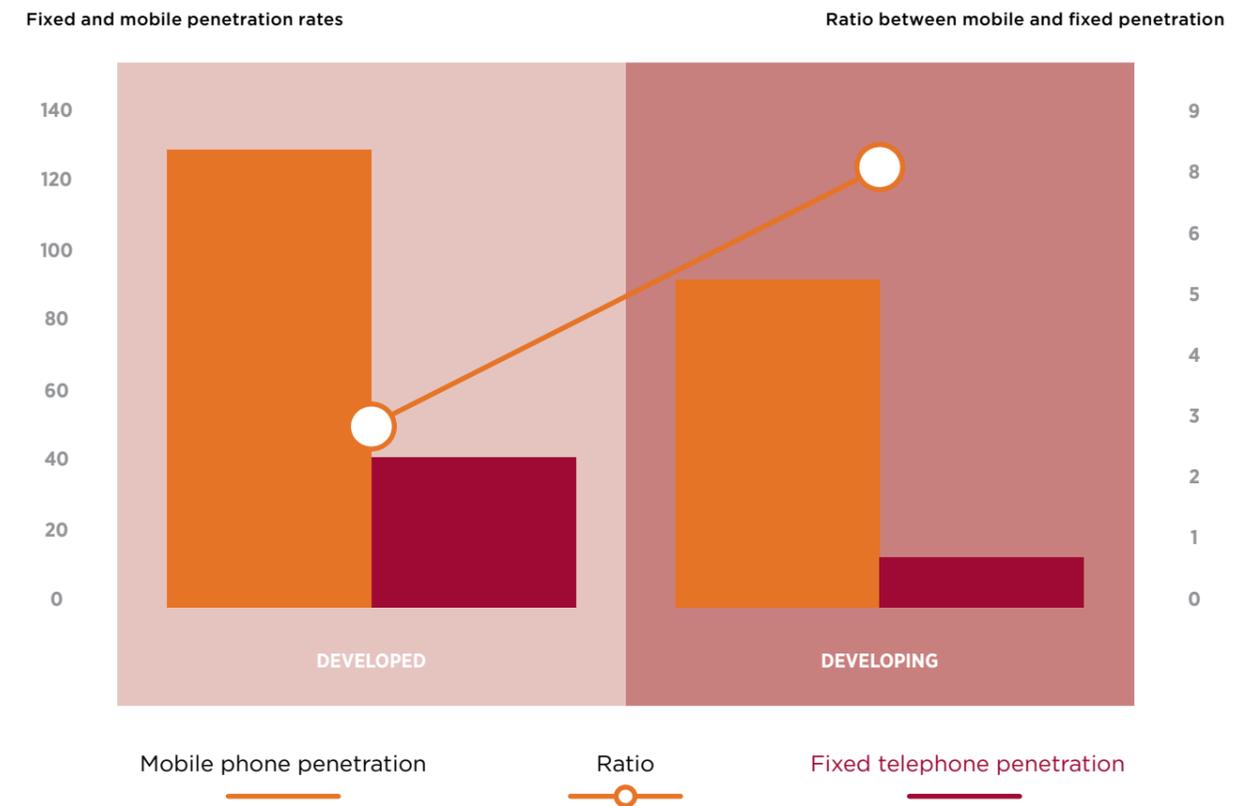
Source: GSMA Intelligence

1.1.5 Investment in mobile is particularly important in many emerging markets due to low fixed uptake

The mobile market arguably has an even larger role to play in emerging market economies due to low fixed line penetration. The ratio of mobiles to fixed lines is much higher in emerging markets,

as shown by Figure 13. This means that mobile networks may represent the only choice for both voice and broadband services for some consumers in emerging markets.

Figure 13
Fixed and mobile penetration



Source: ITU

Note: since fixed lines serve households rather than individuals, fixed and mobile penetration are not directly comparable.

This may explain why the broader economic impact of the adoption of mobile services in emerging markets is significantly higher than in more developed markets. For example, a study for the World Bank found that a 10% increase

in mobile penetration yielded an additional 1.60 percentage points of GDP growth in high income countries and 1.81 percentage points in low and middle income countries.⁶

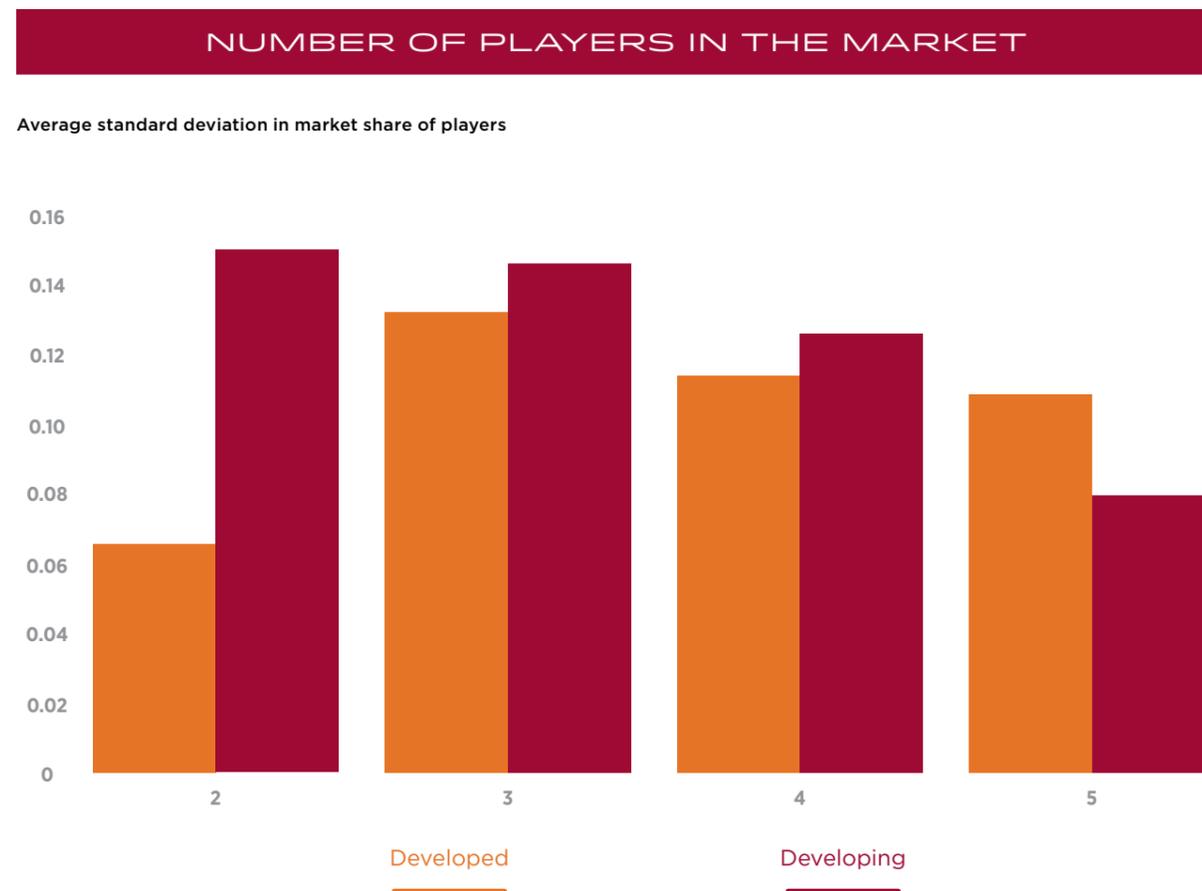
6. Qiang et.al. (2009).

1.1.6 Players are more asymmetric in emerging markets than in developed countries, meaning that coordination is even less likely

In addition to more variation in the number of players than in the developed world, the players in emerging markets also tend to be more asymmetric. We illustrate this in Figure

14, which shows the average standard deviation – a measure of the spread of values – across countries between 2000 and 2014 for markets with different numbers of players.

Figure 14
There is greater variance in the market share of players in developing countries



Source: Frontier based on GSMA data (averaged over 2000 - 2014)

The results show that the standard deviation is typically higher in emerging markets (with the exception of five player markets, which may be biased by a lack of five player markets

in developed countries in recent years). This suggests that there is at least as much, if not more, asymmetry in the players in emerging markets as there is in the developed world.

1.1.7 Implications of emerging market characteristics for merger analysis

The findings from the previous sections suggest that many emerging mobile markets display characteristics which are similar to those that were exhibited in developed markets at an earlier phase of their development, rather than suggesting a fundamentally different trajectory. In particular:

- There is scope for future consolidation in emerging markets. Some emerging markets have five or more players (typically regional players), or two or fewer players (typically smaller countries). But the majority of emerging markets have three or four players. This implies that there may be scope for further consolidation in the future, as we have seen in developed countries in recent years (e.g. Ireland, Germany). Consolidation may also become more common in emerging markets in the future as they reach saturation point.
- There may also be scope for future entry in emerging markets. There are more small players in emerging markets than in developed countries, which may reflect more recent entry. There are also fewer MVNOs, which may mean that there is more scope for MVNO growth in emerging markets in future. However, this does not mean that mergers will not be pursued in some emerging markets, nor that they will necessarily be harmful if and when they are. As emerging markets become more mature and move to new technologies, pressures for further mergers are likely to increase.

- Investment is particularly important in many emerging markets. Fixed uptake is typically lower in emerging markets than in developed countries, which implies that there is more of a role for mobile to play in economic development. This is consistent with research which suggests that the broader economic impact of the adoption of mobile services in emerging markets is significantly higher than in more developed markets.
- Coordination is at least as unlikely in emerging markets as in developed countries. There are large asymmetries in the size of mobile operators in emerging markets, even more so than in developed countries. This suggests that competition in these markets may often be intense and that, in general, competition authorities may not need to focus on concerns about coordination in merger cases.

These conclusions imply that it is important for policymakers in emerging markets to understand how best to assess mergers, a topic which we focus on for the rest of this report.

- Emerging markets lag behind with innovation, but follow similar technology cycles to developed countries. Many emerging markets are still in the 2G growth phase, or migrating from 2G to 3G, but tend to start rolling out each new technology four or five years behind developed countries. Technology cycles appear to last five-seven years, which is about the same period observed in more developed markets. There is, therefore, every reason to suppose that emerging markets will migrate to 3G and 4G technologies as the cycle evolves.

1.2 The current approach to assessing mobile mergers

We have considered how authorities have assessed various five-to-four and four-to-three mobile mergers in five different countries, namely in Argentina, Chile, El Salvador, Indonesia and Uganda. All of these mergers were approved except for the merger in El Salvador. This was because the merging parties were unwilling to accept the proposed remedies relating to spectrum divestment. In both Argentina and Chile, the mergers were only approved subject to spectrum divestment, but in these cases the parties were willing to accept the remedies. In Indonesia, the only remedy imposed by the authority was that the merged entity had to produce quarterly reports for a period of three years on the development of the mobile market, as well as on their products and tariffs. In Uganda, the merger was approved without any remedies.

When assessing the potential anti-competitive effects of the mergers, authorities in each of the markets tended to place particular emphasis on the market shares of the merging parties and the HHI index for the market as a whole. None of the authorities carried out any in-depth analysis to quantify potential price increases from the merger, as is attempted by authorities in Europe and the US. In El Salvador, the authority was reluctant to approve the merger because it considered that one of the merging operators was a maverick, which acted as a price leader. In

contrast, in Indonesia, the authority was keen to approve the merger as one of the merging parties was viewed as a failing firm, so rescuing this party from bankruptcy would allow it to continue providing services to customers.

Authorities had different views on the likelihood of coordinated effects to raise price as a result of the merger. In particular, in El Salvador and Indonesia, coordinated effects were considered as a risk by the authorities. In contrast, in Argentina, the authority concluded that coordinated effects were unlikely due to the degree of differentiation in the market.

The scope for efficiency gains, arising from higher levels of investment or cost savings, was considered in most of the merger cases. In Indonesia and Uganda, authorities concluded that efficiency gains were likely to occur as a result of the merger, which could lead to better quality and lower prices. In contrast, in Chile and El Salvador, the authorities decided that efficiency gains were difficult to verify and/or unlikely to be passed onto consumers. In Argentina, there was no consideration of potential efficiency gains from the merger.

The following table summarises how the different authorities assessed the mobile mergers in their respective countries.

Table 1. Recent mobile mergers in emerging markets

COUNTRY	MERGING PARTIES	IMPACT ON NUMBER OF PLAYERS	ASSESSMENT BY COMPETITION AUTHORITY		
			ANTI-COMPETITIVE EFFECTS	EFFICIENCIES	REMEDIES
ARGENTINA (2005)	Movistar BellSouth	4 to 3	Use of market shares and HHI. Coordinated effects considered unlikely. Rivals may constrain any price increases.	No discussion of efficiency gains.	Spectrum divestment
CHILE (2005)	Movistar BellSouth	4 to 3	Analysis of market shares and HHI. Entry barriers considered high. Limited discussion of coordinated effects.	Efficiency gains due to economies of scale were viewed as a possibility.	Spectrum divestment, as the merged party had 100% of the 800MHz spectrum band. The re-allocation had to be done through an open auction.
EL SALVADOR (2012)	Claro Digicel	4 to 3	Use of market shares and HHI. Digicel considered to be a maverick. Coordinated effects considered possible.	Authority considered claimed spectrum efficiencies being difficult to verify.	Spectrum divestment initially, which the merging parties did not accept
INDONESIA (2014)	XL Axiata Axis Telecom	5 to 4	Use of market shares and HHI. Coordinated effects considered possible. Failing firm defence accepted.	Efficiency claims accepted by authority.	Quarterly reports on market developments for a period of three years
UGANDA (2013)	Airtel Warid Telecom	5 to 4	Merger was considered to create a stronger competitor for the market leader (MTN). New entry viewed as a possibility.	Improvement in service quality expected.	No remedies

Source: Frontier based on publicly available documents

Annexe 1 provides more detailed summaries of the approaches that authorities took to the mergers in the five case study countries.

1.3 Structure of this report

The rest of this report is structured as follows.

- In section 2, we explain why competition authorities should place a high emphasis on the impact of consolidation on investment;
- In section 3, we set out why it is unclear that mobile mergers would necessarily lead to price increases; and
- In section 4, we describe why remedies aimed at reallocating spectrum may not be necessary.

2 Greater emphasis should be placed on the impact of consolidation on investment

Authorities in emerging markets have typically focussed on the potential impact that mobile mergers could have on prices in the short-run due to anti-competitive effects. There is also concern that consolidation could result in less investment. There has been limited focus on the potential impact of mobile mergers on efficiency gains and future investment. Where authorities have analysed such efficiency gains, they have reached diverging conclusions on whether they should be considered as part of the case.

Discussion of investment in recent merger cases

Indonesia

In the 2014 merger between XL Axiata and Axis, the Competition Commission concluded that the merger could give rise to efficiency gains. It found that these could materialise as a result of more

efficient use of spectrum, and economies of scale, resulting from reductions in network costs and overheads.

Chile

In 2005, the court found that a merger between Movistar and BellSouth could lead to economies of scale and a reduction in overhead costs. The

court also concluded that these efficiency gains could be passed on to consumers.

Uganda

Prior to the 2013 merger between Airtel and Warid, the Communications Commission was concerned that service quality had been declining

due to a lack of investment. However, it found that the merger could result in an increase in service quality for consumers.

El Salvador

The competition authority took a different view of the potential for efficiency gains as a result of the proposed merger between Claro and Digicel in 2011. The parties argued that the merger would lead to cost reductions and that the resulting savings would be reinvested in, for example,

new and faster technologies that would benefit consumers. The authority concluded that these claimed efficiency gains were not necessarily merger specific, were difficult to verify and may not be passed on to consumers.

Source: Frontier based on publicly available documents

We have already seen that the mobile industry – in both developed and emerging markets – is characterised by frequent technology cycles which involve large investments by mobile operators. Market performance therefore needs to be assessed across technology cycles, rather than within them. Investment is the main driver of consumer benefits in the mobile sector, through coverage, the quality of products and services, unit prices and wider economic effects.

We have carried out cross-country analysis which suggests that investment is not lower in more concentrated markets. In fact, there are a number of ways in which a particular merger can increase the ability and incentive of operators to invest. In particular, mobile mergers can help increase investment as a result of economies of scale, improved spectrum holdings, better access to commercial partnerships and greater access to financing.

The rest of this section is structured as follows.

- In section 2.2, we explain that the mobile industry is characterised by frequent technology cycles.
- In section 2.3, we set out why investment is the key driver of consumer benefits in the mobile sector.
- In section 2.4, we explain that mergers are likely to increase the incentive and ability of the merging parties to invest under certain conditions.
- In section 2.5, we present econometric analysis showing that investment is not negatively affected by mergers.

2.1 The mobile industry is characterised by frequent technology cycles

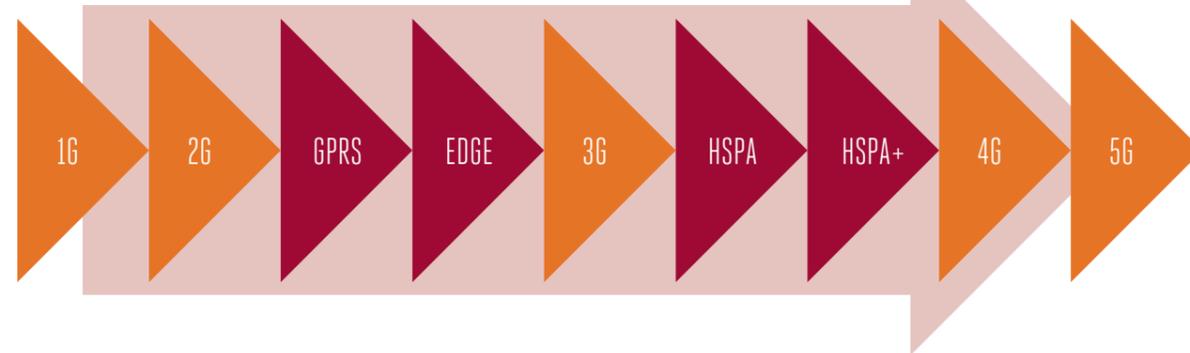
Innovation is a central feature of the mobile industry across the world. Mobile operators determine how quickly and far to roll-out different generations of mobile technologies. The services that can be offered by the mobile sector are unrecognisable to those of 30 years ago. However, as explained in section 1.1.4, emerging markets are lagging behind in the adoption of new technologies. Although these markets are adopting new innovations, the uptake is generally lower than in developed markets at present.

The newer technologies are needed as data usage is forecast to grow rapidly. For example, Cisco has predicted that data usage globally will grow by 61% per year (CAGR) between 2013 and 2018.⁷ This figure is predicted to be 70% for the Middle East and Africa and 66% for Latin America. Figure 15 summarises the key developments in the mobile sector.

7. Cisco (see http://www.cisco.com/c/dam/assets/sol/sp/vni/forecast_highlights_mobile/index.html).

Figure 15
Innovations in the mobile sector

Increasing speeds and wider availability of services



Source: Frontier Economics

Mobile markets follow short technology cycles with a new technology generation being launched every 7-8 years, as Figure 16 below shows. Emerging markets are adopting technologies later than developed markets, such that many markets are still transitioning from 2G to 3G

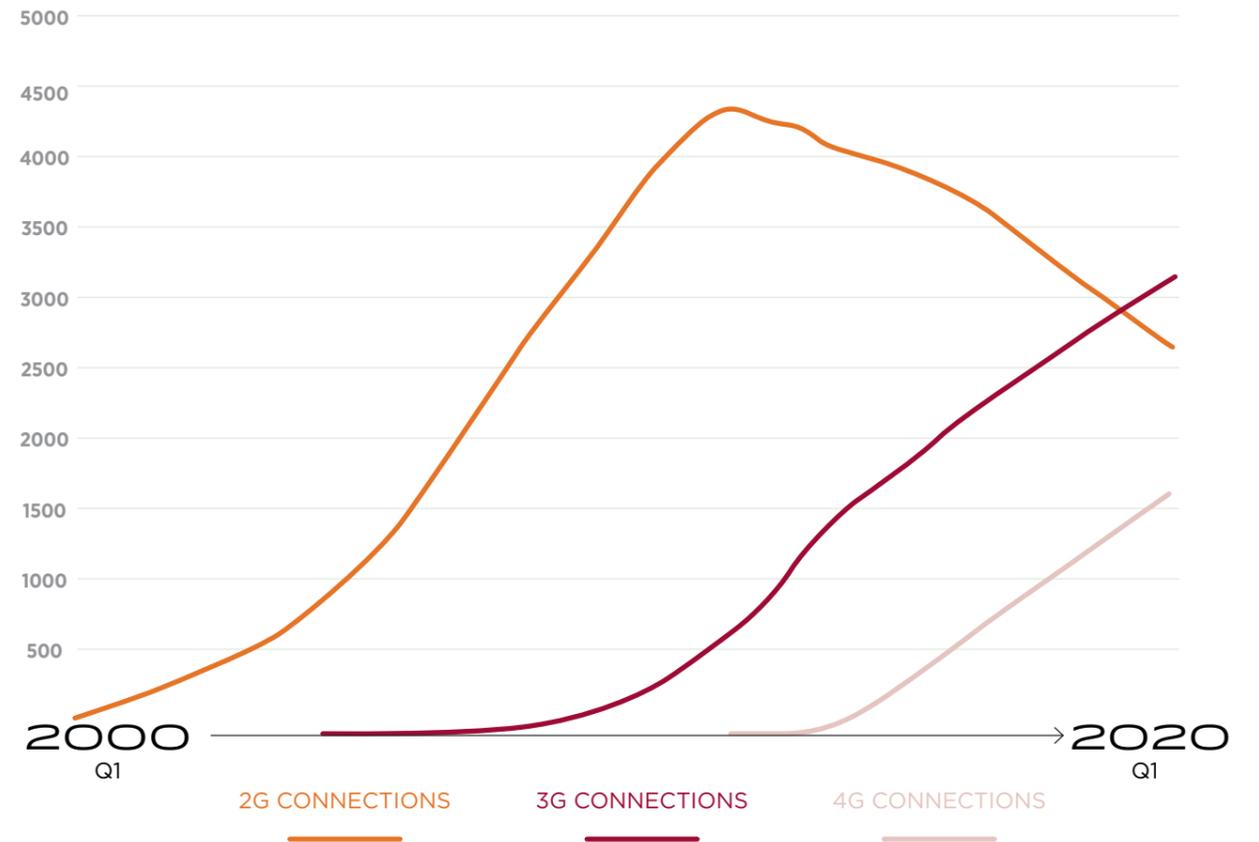
rather than from 3G to 4G, but there is nothing to suggest that the technology cycles are any longer in emerging than developed markets.⁸ These relatively short cycles in mobile markets look set to continue, with 5G currently being developed.

8. 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).

GREATER EMPHASIS SHOULD BE PLACED ON THE IMPACT OF CONSOLIDATION ON INVESTMENT

Figure 16
Technology cycles in developing mobile markets

Total connections Developing countries (Millions)



Source: GSMA Intelligence

Note: analysis relates to developing countries as defined by the GSMA.

GREATER EMPHASIS SHOULD BE PLACED ON THE IMPACT OF CONSOLIDATION ON INVESTMENT

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) (b) significant improvements in the utilisation of capacity (i.e. the volume of data that can be supported over existing spectrum and network) and (c) opportunities for new service innovation (such as smartphones or video distribution).

2.2 Investment is the main driver of consumer benefits

In the mobile sector, investment rather than competition, is likely to be the main driver of consumer benefits. Investment in the mobile industry will benefit consumers in four ways:

- investment can increase the coverage of mobile services;
- investment will impact the quality of products and services which the consumers receive;
- investment will impact the unit prices that consumers pay; and

- investment may provide wider benefits to the economy.

These areas are the key factors relevant for consumer welfare and the effect of investment on these areas is vital. Therefore, the impact of mergers on investment should be fundamental to any assessment of mobile mergers.

We consider the impact of investment on coverage, quality, price and the wider economy below.

2.3 Impact on coverage

As shown in section 1.1.1, coverage of both 2G and 3G technologies is still low in many emerging markets. This means there could be significant consumer benefits if operators increased their investments into coverage. This could have a particularly large impact on consumers who do not have access to fixed infrastructures, as is the case in most emerging markets. Further, some

emerging markets, particularly those in East Africa, make extensive use of mobile banking services. Research suggests that these services foster greater financial inclusion, which may have a positive impact on incomes.⁹ Increasing access to such services by expanding mobile network coverage could therefore have a tangible impact on consumers.

2.3.1 Impact of investment on quality

Each new mobile technology delivers significant increases in both capacity and network speeds. Many networks in emerging markets face capacity limitations, often as a result of spectrum constraints or simply because individual base stations support much greater volumes of traffic. This means that the pace at which new

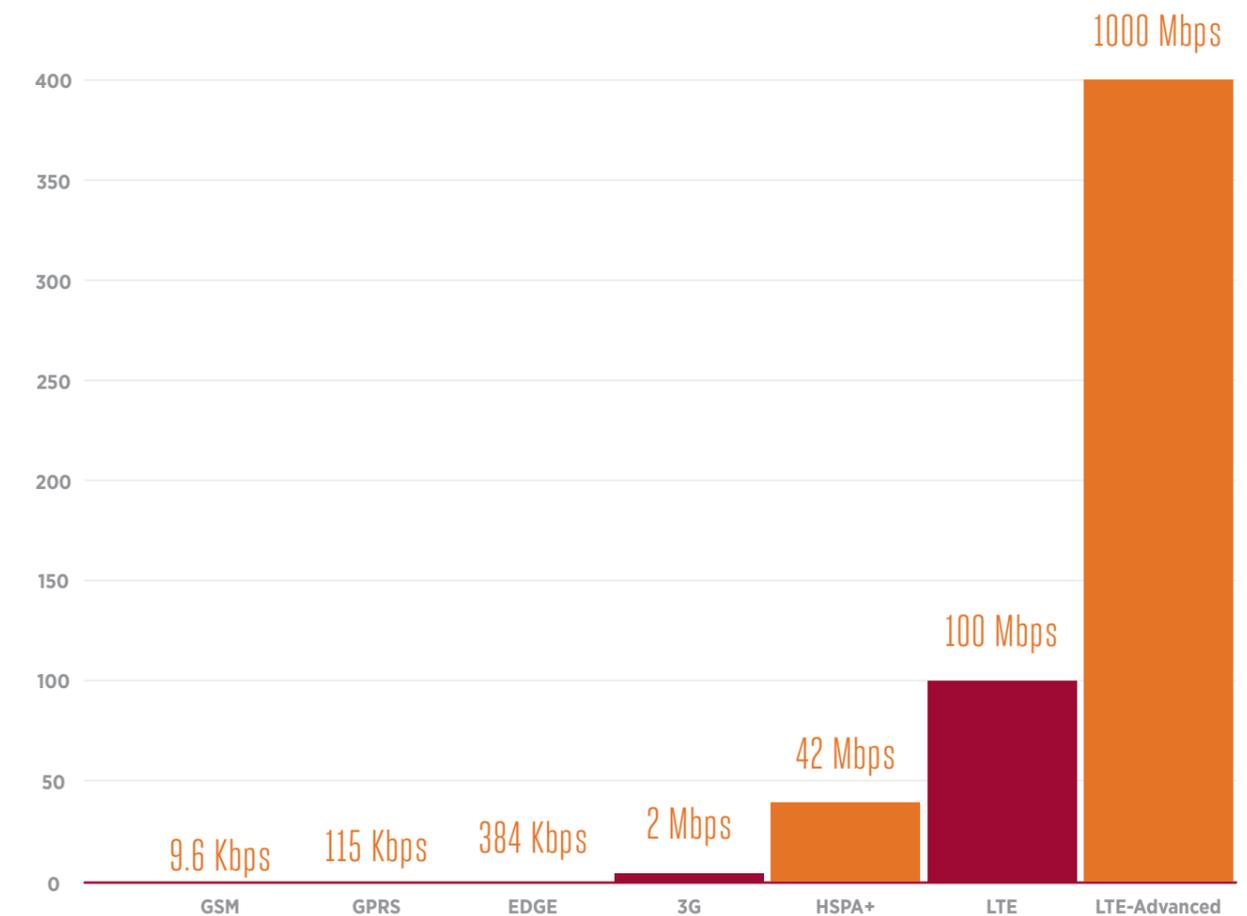
technologies are rolled out by operators can have a particularly significant impact on the quality of voice services that consumers receive, as well as providing access to new data services. Figure 17 shows the exponential increases in data speeds offered by new services.

9. See <https://openknowledge.worldbank.org/bitstream/handle/10986/4173/WPS4981.pdf?sequence=1> and <http://www.gsma.com/mobilefordevelopment/programmes/mobile-money-for-the-unbanked/about>

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Figure 17

Data speeds have increased significantly with each technology cycle



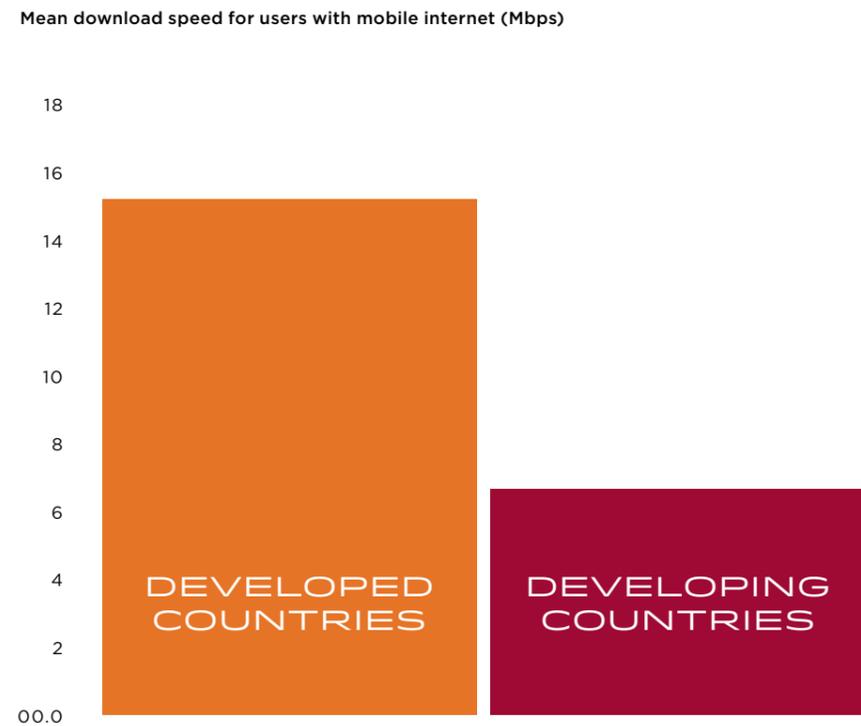
Source: Frontier based on ITU data

In emerging markets which, as explained above, are still in the process of adopting 3G, the impact of investment in 4G and later technologies have the potential to lead to a large jump in quality. This is vital for emerging markets where mobile

data is needed as a substitute for fixed broadband in many areas, given the poor coverage of fixed broadband. As shown in Figure 18, download speeds currently are much lower in developing countries.

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Figure 18
Download speeds are much lower in emerging markets



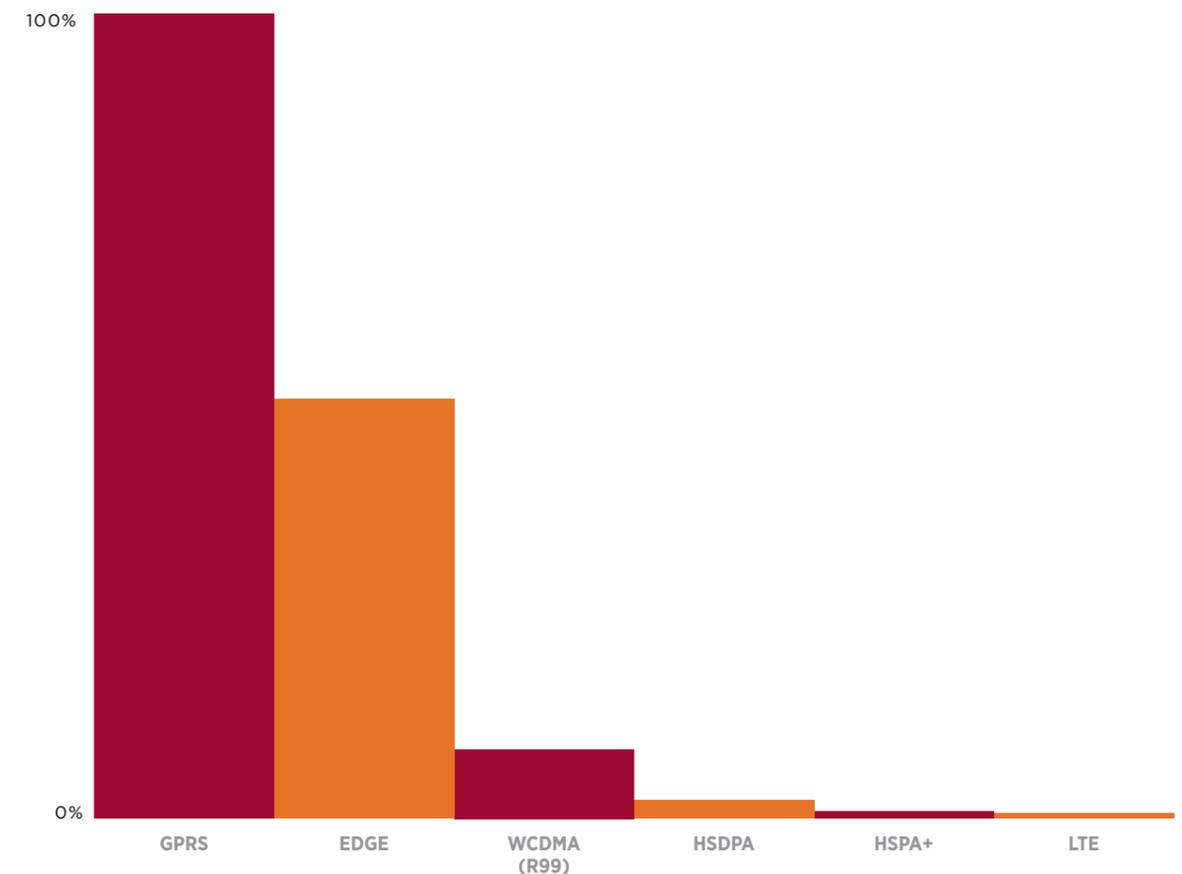
Source: Ookla

2.3.2 Impact of investment on prices

As explained above, dynamic efficiencies and investment in new mobile technology have led to increases in quality. The unit costs of services have also fallen, as new mobile technologies stimulate much higher volumes. As shown by

the figure below, in mobile markets, the new technology cycles produce dynamic efficiencies which translate into very large reductions in unit costs (often by a factor of 5 or more).

Figure 19
Cost per MByte of different technologies, relative to GPRS¹⁰



Source: <http://www.gsma.com/spectrum/wp-content/uploads/2012/03/22092009182239.pdf>

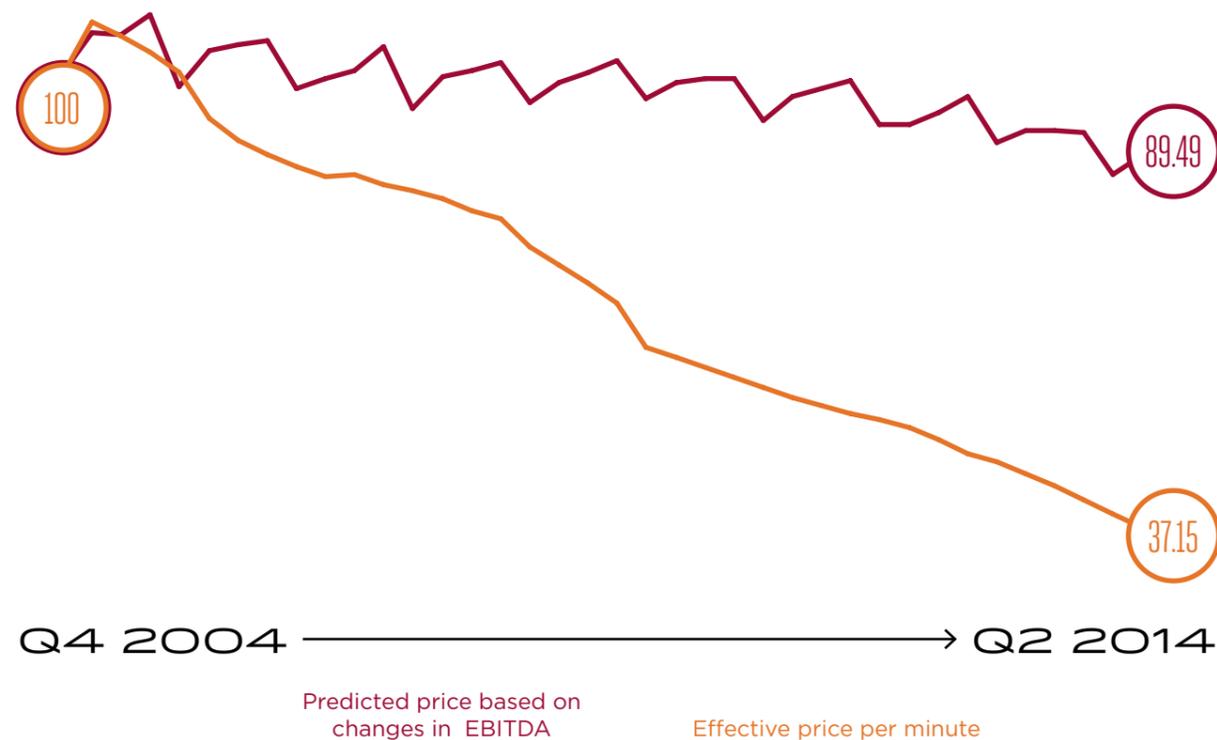
The drastic falls in unit costs that arise from rolling-out new technologies would suggest that these dynamic efficiencies are the main driver of unit price reductions in mobile markets. Furthermore, evidence suggests that changes in profits only explain a small proportion of the changes in unit prices. To test this, we have examined the trend in EBITDA margins and unit prices¹¹ for the longest time period for which we were able to obtain consistent data - from 2004 to 2014 - for emerging markets.

Voice unit prices have fallen significantly over time in the markets analysed. However, the fall in EBITDA margins has been much smaller, which suggests that changes in profits cannot explain the unit price increases. The fall in EBITDA margins between 2004 and 2014 would suggest that unit prices should have fallen by only 4%. However, in reality, unit prices fell by 75%. This suggests that the vast majority of unit price reductions arise instead from dynamic efficiencies, probably as a result of the transition from 2G to 3G technologies in some markets and upgrades from GSM to GPRS and EDGE in others.

10. 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.

11. 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.

Figure 20
Unit price reductions compared to changes in EBITDA margins in EU markets



Source: Frontier Economics based on GSMA database

2.4 Mergers are likely to increase the incentive and ability of the merging parties to invest under certain conditions

Competition authorities are sometimes sceptical about the impact of mergers on incentives to invest. However, in this section we explain that mergers may increase both the incentive and ability of merging parties to invest under certain conditions. We consider that more focus should be placed on such impacts in merger decisions.

In the merger decisions that we have reviewed, there were diverging views on the impact that mergers could have on efficiency gains. In Indonesia, Chile and Uganda, the authorities considered that the merger could lead to efficiency benefits. In contrast, in El Salvador, the authorities concluded that the claimed efficiency gains were not verifiable. In Argentina, there was no discussion of efficiency gains.

When operators merge, they are able to pool together their assets and customers. One potential benefit of mergers is that it may allow operators to reduce their existing cost base by reducing duplication. This has often been the focus of attention for authorities in the past, who want to establish whether these cost savings will then be passed on to consumers in the form of lower prices or to shareholders in the form of higher profits. However, another potential benefit, which may be even more important for consumers in the longer term, is that mergers

may increase the incentive and capacity to make investments in new technologies.

We therefore focus on the impact that a merger has on the merged firm's incentive and/or ability to make new investments. There are at least four mechanisms that mean that the merged firm may decide to increase investments in emerging markets:

- economies of scale (section 2.4.1);
- improved spectrum holdings (section 2.4.2);
- access to commercial partnerships to deliver innovative services (section 2.4.3); and
- access to greater financing (section 2.4.4).

As we explain throughout the rest of this section, we consider that some of these factors may be particularly important in emerging markets. A more detailed discussion of the different unilateral and multilateral incentives which mobile operators are likely to face when making investment decisions, and the likely effect that mergers can have upon them, is provided in our study for the GSMA on merger assessments in developed markets.¹²

12. See "Assessing the case for in-country mobile consolidation", Frontier Economics, February 2015.

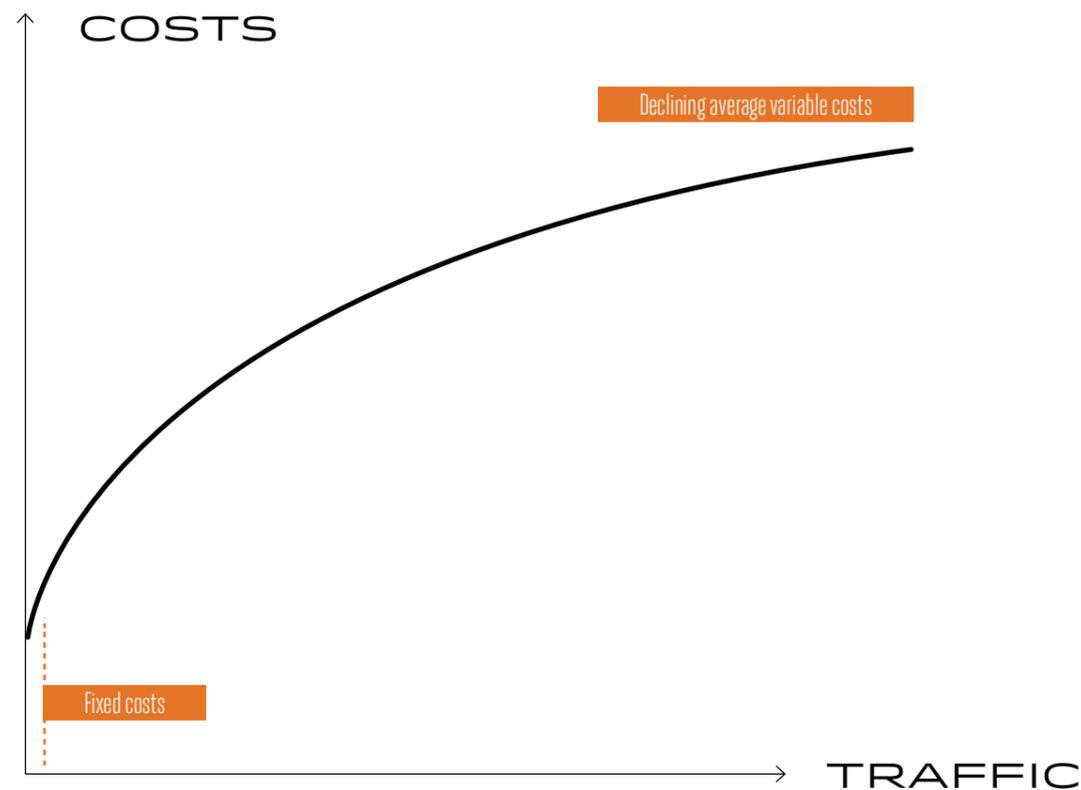
2.4.1 Economies of scale

Economies of scale mean that average costs fall at higher levels of output. They can arise for two reasons. First, there are fixed costs associated with mobile networks that do not depend on the level of output. As output increases, these fixed costs can be spread over more units of output. Second, average variable costs may fall with higher output. For example, this could be the case if the cost of equipment is not directly proportional to its

capacity, meaning that a piece of equipment with double the capacity does not cost double the amount. We would expect the main source of economies of scale to stem from the spreading of fixed costs over more subscribers, rather than declining average variable costs.

Figure 21 below illustrates both potential sources of economies of scale.

Figure 21
Economies of scale



Source: Frontier Economics

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As ARPUs tend to be low in emerging markets, there may be a greater need for operators to gain scale. The costs of purchasing network equipment is not likely to vary that much across countries, so is unlikely to fully reflect the lower expenditure on mobile services in emerging markets (although we recognise that many other costs may be lower). Operators in emerging markets may need greater scale to be able to recover these fixed costs. This is reflected, for example, in the much higher call volumes (and congestion levels) that base stations in some emerging markets are required to support. Operators need to support more users per site in order to support the fixed costs of that site.

Greater economies of scale may provide operators with a greater incentive to expand both coverage and capacity, which may be particularly beneficial in some emerging markets due to the lack of a good quality fixed infrastructure.

While consumers would always benefit from increased coverage by the merging party, the

biggest impact on consumer welfare will be attained when the merger leads to an increase in overall coverage. That is, when the merging party takes the lead in covering areas which would remain uncovered without the merger, instead of just matching the coverage of its competitors. This scenario is most likely to happen when the merger creates a market leader which is able to go beyond its rivals.

Economies of scale may also incentivise operators to upgrade their existing network, either by installing more equipment of the same generation or by installing a new generation of equipment. Upgrading a mobile network implies incurring fixed costs, including installation costs, the cost of acquiring new equipment, etc. As in the case of coverage investments, the investment case will depend on whether there are sufficient subscribers from which to recover the fixed costs required to upgrade the network.

2.4.2 Improved spectrum holdings

In many cases, the merger allows the merging parties to pool complementary assets, which increase the ability of the merging party to undertake investments. This is, for example, the case when the merger results in improved spectrum holdings or when the merger provides access to a greater number of base station sites.

As a result of a merger, the new entity will be able to combine the spectrum holdings of the two merged firms. This could increase investment for the following reasons:

- the merged operator can benefit from spectrum aggregation;
- more low frequency spectrum could lower the costs of network roll-out in less densely populated areas; and/or
- the merged operator can re-farm spectrum earlier.

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Spectrum aggregation

Spectrum is often scarce in emerging markets. There are therefore significant benefits that can be gained from aggregating spectrum. Under a scenario where neither of the two parties involved in the merger holds the amount of spectrum necessary to deploy a new technology, the merger, by allowing the aggregation of spectrum, may provide the ability to the merged entity to invest in the new technology. The spectrum

aggregation resulting from a merger will also increase the incentives of the merged party to improve its capacity and, therefore, lower unit prices and/or improve quality. In addition, the merged party may be able to launch services using the aggregated spectrum which rivals may find hard to match. This would be the case if the merger creates or increases the asymmetry in spectrum holdings between parties in the market.

Lower costs of network roll-out in less densely populated areas

Spectrum holdings and network equipment are to some extent substitutable. A greater holding of low frequency spectrum could increase operators' incentives to expand coverage into less densely populated areas. This is because less network equipment will be required with a greater holding

of low frequency spectrum. This effect could be particularly important in emerging markets given that not everyone will have mobile coverage and those who don't are also unlikely to have access to a fixed network.

Spectrum re-farming

Different spectrum bands can be used for different technologies. Some emerging markets already allow operators to re-farm spectrum to other technologies, although others do not (or require additional approvals to be obtained first). Mergers may increase the opportunities

for operators to re-farm spectrum to new technologies by lowering the costs of doing so and by ensuring there is sufficient spectrum to support existing demand. Re-farming is another way that new technologies can be deployed.

2.4.3 Access to commercial partnerships to introduce innovative services

In many cases, product innovations introduced by mobile operators in emerging markets are implemented through commercial partnerships with companies in other sectors. For example, the implementation of mobile banking is taking place via partnerships between mobile networks and banks, and 'smart car' technologies are being introduced in association with car manufacturers.

In such cases, the chances of finding a successful partner to deploy an innovative service may be higher for larger operators, as the new service is offered to a larger customer base, which makes the investment more attractive. The launch of M-Pesa by Safaricom in Kenya is a case in point, but research by GSMA suggests that new services

are launched by the leading (i.e. largest mobile operator) in the majority of cases. By creating a larger operator, the merger will increase the ability of the merged party to participate in innovative partnerships.

These partnerships bring significant benefits to consumers. Research shows that employment and incomes can increase with greater financial inclusion.¹³ At the same time, 2.5 billion people in emerging markets do not have traditional bank accounts. However, 1 billion of these people have access to a mobile phone, allowing mobile banking to foster greater financial inclusion.¹⁴ As a result, mobile banking has come to play an important role in several emerging markets.

13. <https://openknowledge.worldbank.org/bitstream/handle/10986/4173/WPS4981.pdf?sequence=1>

14. <http://www.gsma.com/mobilefordevelopment/programmes/mobile-money-for-the-unbanked/about>

Importance of operator's size in the deployment of mobile banking services

In many developing countries, mobile operators have introduced mobile payment and/or banking as an alternative to traditional banking systems which are often under-developed in the developing world. These services provide another dimension on which operators compete and are becoming very popular in areas such as East Africa. Mobile money services typically include on-network account to account money and airtime transfers in addition to over-the-counter money transfers through agents. Other related services offered by some operators involve bill payments to utility companies, government transfers to individuals and merchant payments. Mobile banking is typically taking place via partnerships between mobile networks and banks, whilst the additional services also involve partnerships and agreements with a wide range of other companies, such as utility providers and merchants.

Money mobile is at present typically an on-network service only; therefore, there are considerable network effects at play. Size is of great importance to mobile operators running these services for a number of reasons:

- A large existing agent network increases the reach of mobile money services;
- A large subscriber base increases the attractiveness of the network to customers as it increases the number of transactions they can perform (in a scenario without interoperability); and

- A large subscriber base increases the attractiveness of the network to other businesses that may wish to form commercial partnerships as they benefit from access to a larger customer base (this will cause second round effects by improving the attractiveness of their service offerings).

GSMA data on the introduction of mobile banking services around the world¹⁵ shows that, indeed, these services have been introduced by leader mobile operators in 67% of the cases. In 81% of the cases, the operator leading the introduction of mobile banking services held a market share above 30% in terms of subscribers.¹⁶

15. <http://www.gsma.com/mobilefordevelopment/programmes/mobile-money-for-the-unbanked/insights/tracker>

16. Market share data comes from Globalcomms.

2.4.4 Access to greater financing

In a perfectly functioning capital market, operators should be able to fund any investment that has a positive Net Present Value (NPV). However, in some emerging markets, there may be imperfect credit markets. This could be partly due to the country having a less developed financial system. Getting access to external financing from other more developed countries may also be challenging in emerging markets, as there may be greater political and regulatory uncertainty. This will be more of a concern for operators that do not form part of a large international group. The overall impact could be that some operators simply cannot obtain enough

financing for an investment. Alternatively, some operators may be able to obtain financing, but only at a cost that makes possible investments unprofitable.

Mergers may improve operators' access to financing, as larger operators may find it easier to attract financing. External financiers may view larger operators as being less risky, as they may have more stable cash flows and, therefore, be more profitable. Further, the operators may have higher cash flows post-merger, so may be able to re-invest this, which may make them less reliant on external financing.

2.5 Cross-country analysis suggests that investment is not negatively affected by greater market concentration

Many public authorities believe that adding more operators to a market will increase levels of investment in the market. However, we have undertaken statistical analysis (based on econometrics) which suggests that the level of concentration does not in fact have a clear influence on investment in emerging markets. We use quarterly GSMA data between 2000 and 2014 for MNOs in 80 three and four player emerging markets to determine the key factors that influence our investment measure, capex per subscriber.¹⁷ Here we focus on three and four player markets, since the majority of emerging markets have three or four players (as shown in Figure 4), although there have been several recent five-to-four or four-to-three mergers (see Table 1).

To focus on the difference between three and four player markets, we restrict our sample to three

and four player markets. We define a "player" as an MNO with a market share of at least 5%. We measure investment as capex/subscriber, which we consider is likely to be a superior measure of investment to capex/revenue, which is also influenced by the level of prices.

We note that finding a perfect measure of capex is challenging. The GSMA data that we have used is based on data from the mobile operators. In some cases, capex may have been measured using different methodologies. However, we have no reason to believe that this would bias our results as there would only be a bias if operators in markets with a high level of concentration tended to use a different methodology for measuring capex to operators in countries with a low level of concentration. Moreover, capex data is generally volatile, making trends harder to distinguish.

17. We use the GSMA's definition of emerging markets, as per the GSMA Intelligence classification of "developing countries".

The characteristics of emerging markets can vary widely. In particular, incomes are likely to differ significantly across regions, which could cloud the impact of competition on investment. To isolate the impact of competition on investment,¹⁸ we control for this variation by carrying out our analysis separately for “high” and “low” GDP countries.¹⁹

To determine the impact of competition on investment, we use two alternative measures of competition:

- HHI, which measures market concentration as the sum of squares of MNO market shares; and
- a dummy variable which identifies four player markets.

We control for a range of other factors that may also impact investment. These include the launch

of 2G, 3G and 4G services, the percentage of pre-pay connections, GDP per capita – which varies across countries within the high and low groups – and year dummies.

We also include the lag of capex per subscriber, as we would expect capex to adjust slowly in response to changes in other factors because the costs of doing so are high.²⁰ Moreover, operators are likely to follow long-term investment plans, so we would expect a degree of path dependency in investment.

We have estimated a number of different models of capex to ensure that our results are robust. Table 2 and Table 3 provide the detailed results of our analysis for high and low GDP countries respectively. Relationship (1) is our preferred specification, whilst relationships (2) to (6) relate to sensitivity tests.

18. The standard deviation relative to the mean value of GDP per capita (in PPP terms) – a measure of the relative spread of values across data samples – is 39% higher for emerging markets than for developed countries, on average.

19. We define a high GDP country as one which has GDP per capita (in PPP terms) greater than or equal to the sample median, and a low GDP country as one which has lower GDP per capita than the sample median. We do this for each quarter in the sample.

20. The FE estimator is biased in autoregressive models, which is known as the “Nickell-bias” (<http://fmwww.bc.edu/ec-c/S2004/771/NickellEM81.pdf>). However, this bias disappears in datasets with many time periods. In our analysis we have 15 years of quarterly data, so it is unproblematic to include lagged capex.

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Table 2. Econometric analysis of the relationship between competition and investment – high GDP countries

	(1)	(2)	(3)	(4)	(5)	(6)
DEPENDENT VARIABLE	log(capex per subscriber)					
HHI	0.25 (0.33)	0.20 (0.37)	-	0.00 (0.00)	0.19** (0.08)	-
4 PLAYER DUMMY	-	-0.03 (0.08)	-0.05 (0.07)	-	-	-0.01 (0.04)
2G NETWORK DUMMY	0.88*** (0.16)	0.87*** (0.16)	0.87*** (0.16)	10.47* (6.07)	-0.66*** (0.19)	-0.62*** (0.19)
3G NETWORK DUMMY	0.26*** (0.09)	0.26*** (0.09)	0.26*** (0.09)	1.18 (0.85)	0.13*** (0.05)	0.14*** (0.05)
4G NETWORK DUMMY	0.33*** (0.10)	0.33*** (0.10)	0.34*** (0.10)	4.63* (2.72)	0.21* (0.13)	0.20 (0.13)
% PRE-PAY CONNECTIONS	-0.09 (0.08)	-0.09 (0.08)	-0.08 (0.08)	1.19 (16.17)	-0.04 (0.03)	-0.04 (0.03)
GDP PER CAPITA (IN PPP TERMS)	0.35 (0.52)	0.40 (0.52)	0.43 (0.52)	0.00 (0.00)	0.03 (0.05)	-0.02 (0.05)
LAGGED CAPEX PER SUBSCRIBER	0.34*** (0.05)	0.34*** (0.05)	0.34*** (0.05)	0.42*** (0.00)	0.60*** (0.02)	0.60*** (0.02)
NUMBER OF OBSERVATIONS	2,258	2,258	2,258	2,262	2,258	2,258
R ²	0.28	0.28	0.28	0.88	0.49	0.49
TIME FE	Yes	Yes	Yes	Yes	Yes	Yes
MNO FE	Yes	Yes	Yes	Yes	No	No
METHODOLOGY	FE	FE	FE	FE	OLS	OLS

Source: Frontier based on GSMA database

Figures in parentheses indicate robust standard errors

*** p<0.01, ** p<0.05, * p<0.1; † R2 values are not comparable between FE and OLS models

Relationships (1), (2), (3) and (5) are log-log models with all non-dummy variables in logarithmic form

GREATER EMPHASIS SHOULD BE PLACED ON THE IMPACT OF CONSOLIDATION ON INVESTMENT

Table 3. Econometric analysis of the relationship between competition and investment - low GDP countries

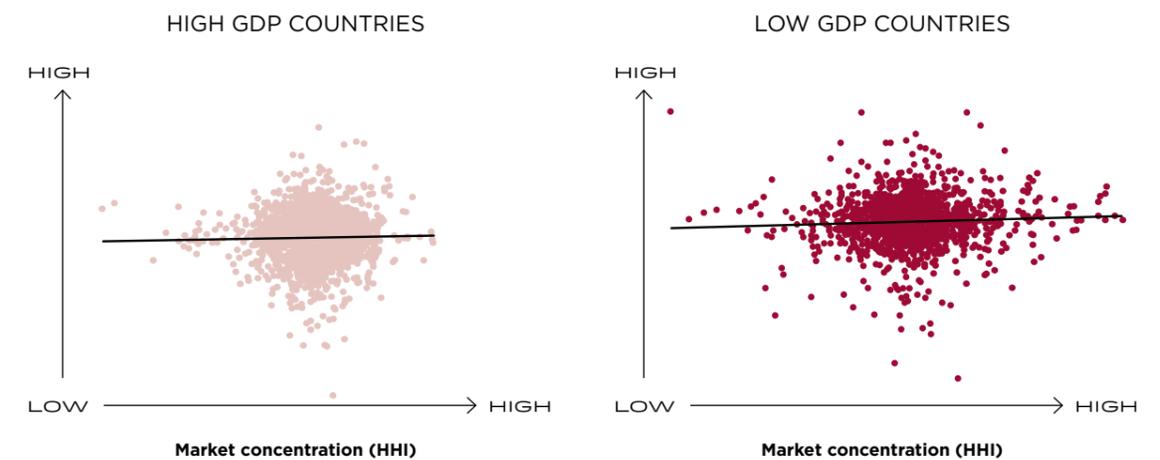
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable	log(capex per subscriber)					
HHI	0.43 (0.27)	0.60* (0.31)	-	0.00 (0.00)	0.24** (0.11)	-
4 player dummy	-	0.13* (0.07)	0.06 (0.06)	-	-	-0.07* (0.04)
2G network dummy	-	-	-	-	-	-
3G network dummy	0.27*** (0.10)	0.26** (0.11)	0.30*** (0.10)	3.95 (4.07)	0.12** (0.05)	0.14*** (0.05)
4G network dummy	0.17 (0.16)	0.18 (0.15)	0.19 (0.17)	3.08 (4.45)	0.06 (0.17)	0.07 (0.17)
% pre-pay connections	0.33 (0.32)	0.44 (0.33)	0.31 (0.28)	87.45** (35.41)	0.30* (0.16)	0.23 (0.16)
GDP per capita (in PPP terms)	-0.56 (0.62)	-0.65 (0.62)	-0.84 (0.64)	-0.00 (0.01)	0.00 (0.04)	-0.02 (0.04)
Lagged capex per subscriber	0.46*** (0.05)	0.46*** (0.05)	0.47*** (0.05)	0.15*** (0.03)	0.70*** (0.02)	0.70*** (0.02)
Number of observations	1,441	1,441	1,441	1,441	1,441	1,441
R²**	0.48	0.48	0.48	0.32	0.62	0.62
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
MNO FE	Yes	Yes	Yes	Yes	No	No
Methodology	FE	FE	FE	FE	OLS	OLS

Source: Frontier based on GSMA database
 Figures in parentheses indicate robust standard errors
 *** p<0.01, ** p<0.05, * p<0.1; † omitted because MNOs in the sample have had 2G networks in place throughout the period; ** R2 values are not comparable between FE and OLS models
 Relationships (1), (2), (3) and (5) are log-log models with all non-dummy variables in logarithmic form

GREATER EMPHASIS SHOULD BE PLACED ON THE IMPACT OF CONSOLIDATION ON INVESTMENT

Figure 22

Higher market concentration does not lead to less investment in emerging markets



Source: Economics based on GSMA Intelligence

- **There is no clear link between the level of competition and investment in emerging markets**, as indicated by the fact that greater competition does not have a statistically significant impact on investment in most of our regression models. Where the impact is statistically significant, it implies that more competition reduces investment.
- **Other factors appear to be important for determining levels of investment.** While not the focus of this study, and recognising that capex is generally volatile, our analysis suggests that past capex influences current capex. Moreover, capex has increased as MNOs have rolled out 2G, 3G and 4G networks.
- **This conclusion is robust to the relationship that we assume about capex and its explanatory factors**, as illustrated by the sensitivity tests carried out around our preferred specification.

GREATER EMPHASIS SHOULD BE PLACED ON THE IMPACT OF CONSOLIDATION ON INVESTMENT

Our preferred investment relationship

Relationship (1) is our preferred specification for the following reasons.

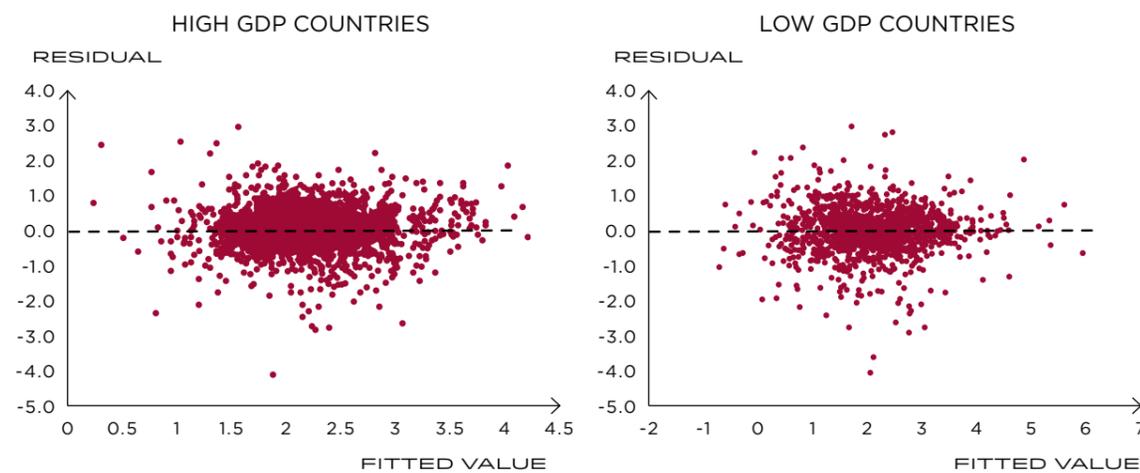
- The Fixed Effects (FE) model is likely to provide a better fit than the Ordinary Least Squares (OLS) model. The FE model controls for unobserved differences across countries and MNOs, which may be significant for emerging markets. This means that the estimated relationships rely solely on variation in competition over time and not across countries.
- In this situation, we consider HHI to be a more appropriate measure of the level of competition than a four player dummy. This is because

HHI reflects the competitive landscape more accurately than an indicator of the number of players. Moreover, in a FE model, the dummy captures the effect of a change in the number of players within a country only.

- Converting data into logarithmic form reduces the impact of outliers on the results and is a common approach to econometric analysis.

Moreover, analysis of the residuals produced under relationship (1) suggests that there are no obvious outstanding systematic factors that influence investment. In particular, Figure 23 suggests that these residuals fluctuate randomly around zero.

Figure 23
Residuals under our preferred relationship (1)



Source: Frontier Economics

GREATER EMPHASIS SHOULD BE PLACED ON THE IMPACT OF CONSOLIDATION ON INVESTMENT

3 It is unclear that mobile mergers will lead to price increases

In recent merger cases in emerging markets, competition authorities have been concerned that consolidation could result in price increases due to anti-competitive effects. They have typically placed significant emphasis on the market shares of the operators, and the pre- and post-merger HHI.

Uganda

The Communications Commission found that the 2013 merger between Airtel and Warid could create a stronger rival to MTN, the market leader

El Salvador

The competition authority found that the proposed 2011 merger between Claro and Digicel would increase already high market concentration (based on an analysis of HHI, market shares, entry barriers and spectrum shares). It also found that the merger would remove an important competitive force – Digicel – from the market, and that the merged entity may embark on a strategy of

Source: Frontier, based on publicly available documents

at the time. The Commission also concluded that market entry was a possibility.

predatory pricing.

The authority also considered that the merger could lead to coordinated effects. It found that the mobile market was susceptible to coordination since market shares were high, and that the merging parties had previously been investigated for coordination.

To test this, we have performed an econometric analysis to assess the possible link between the HHI and mobile prices. This shows that there is no evidence that mobile prices are higher in more concentrated markets.

In some mobile merger cases, competition authorities have also been concerned that the merger may lead to coordinated effects. This would be the case if the merger makes it easier for the operators left in the market to jointly raise prices and/or reduce quality.

We consider that it is unlikely that a merger would lead to coordinated effects in any market, and that conditions in most emerging markets would make this particularly difficult. Our analysis suggests that operators would not be able to reach a coordinated agreement given the asymmetric nature of their operations and the continued growth in demand. Moreover, assuming that they were able to reach such an agreement, it would be both internally and externally unsustainable.

In the recent Indonesian merger, the competition authority considered that one of the merging parties was a failing firm. We agree that in such circumstances, there is a particularly strong case for allowing the merger to go ahead. In emerging markets, there are a greater number of smaller

operators than in more developed markets. It is difficult to know whether this reflects a greater tendency for firms to fail, or simply that there are many more recent entrants in emerging markets. However, it does suggest there could be potential mobile mergers involving smaller operators in future. We consider that this could lead to stronger competition in the market, as in the absence of the merger, the smaller operator may struggle to impose a significant competitive constraint. Empirical evidence shows that over the past 5 years in emerging markets, only 10% of operators who had a starting market share below 5% have managed to increase their market share above the 5% threshold.

The rest of this section is structured as follows:

- In section 3.2, we explain why simple competition measures may not accurately capture the impact of mobile mergers;
- In section 3.3, we present cross-country analysis which suggests that prices are not lower in four player markets;
- In section 3.4, we set out why coordinated effects may be unlikely in mobile markets; and
- In section 3.5, we explain why the position of small players may be unsustainable.

IT IS UNCLEAR THAT MOBILE MERGERS WILL LEAD TO PRICE INCREASES

3.1 Simple competition measures may not accurately capture the impact of mobile mergers

In recent merger cases, competition authorities in emerging markets have linked the potential for anti-competitive effects to changes in market shares or HHI. These measures may provide a useful starting point for merger analysis because they provide a basic indication of the level of competition and market structure. However, we consider that further analysis will be required and that authorities should not rely simply on HHI measures. This is because they are likely to suffer from the following issues:

- Analysis based on changes in market shares will predict price increases for any merger. This would occur independently of the true competitive situation in the market, implying that such analysis is likely to be too simplistic.
- They do not provide a sufficiently granular indication of the level of competition. They show how an operator has performed on average across various market segments.
- In large part, market shares reflect the results of past competition, rather than necessarily capturing the current or future level of competition. Market shares reflect the size of an operator's subscriber base (or the revenue that it generates from this base), but at any one time only a proportion of this subscriber base will be considering switching (due to, for example, minimum term commitments). This means that market shares do not necessarily reflect the current or future level of competition.
- Switching rates may also provide useful information about the current level of competition. Switching rates focuses on those customers who are currently considering alternative mobile operators.

- Analysis of qualitative market characteristics enables a more comprehensive picture of competition to be developed. Qualitative evidence can provide an insight into the level of competition that market shares do not necessarily capture. For instance, tariff design and marketing efforts can give an indication of how closely mobile operators target each other's customers, particularly if they are monitored over time.

Competition authorities in many developed markets will tend to use market shares as a starting point but do not attach significant weight to them in merger decisions. Instead, they analyse a range of additional information (such as that described above) to provide a more accurate picture of the level of competition in a given market.

IT IS UNCLEAR THAT MOBILE MERGERS WILL LEAD TO PRICE INCREASES

3.2 Cross-country analysis suggests that prices are not lower in four player markets

We have carried out econometric analysis which shows there is no direct link between the level of competition and prices in emerging markets. In particular, we used quarterly GSMA data between 2000 and 2014 for MNOs in 74 emerging markets. To focus on the difference between three and four player markets, we have restricted our sample to three and four player markets. We define a “player” as an MNO with a market share of at least 5%.

We measure prices using Average Revenue Per Minute (ARPM) data. We consider that this is likely to be a superior measure of prices to Average Revenue Per User (ARPU), given that ARPU does not take into account differences in usage. However, we note that an ideal measure of prices would take into account data usage, particularly given that it has increased in recent years. Unfortunately, such information is not readily available, so we consider ARPM to be the best measure possible given these limitations.

As with our analysis of investment in section 2.5, we have split emerging markets into high and low GDP per capita countries.²¹ To determine the impact of competition on investment, we use two alternative measures of competition:

- HHI, which measures market concentration as the sum of squares of MNO market shares; and
- a dummy variable which identifies four player markets.

We control for a range of factors that may impact the level of prices. These include the launch of 2G, 3G and 4G services, the share of pre-pay connections, GDP per capita, subscriber numbers and the lag of prices. We include this because we might expect prices to react slowly to changes in other factors, given that adjusting prices could incur significant costs.²² We also include year dummies in our models, as prices have tended to show a strong trend over time, as shown in Figure 20.

We have estimated a range of different models to ensure that our results are robust. Table 4 and Table 5 provide the results of our analysis for six potential relationships between prices and its explanatory factors. Relationship (1) is our preferred specification, whilst relationships (2) to (6) show sensitivity tests.

21. We define a high GDP country as one which has GDP per capita (in PPP terms) greater than or equal to the sample median, and a low GDP country as one which has lower GDP per capita than the sample median. We do this for each quarter in the sample.
 22. The FE estimator is biased in autoregressive models, which is known as the “Nickell-bias” (<http://fmwww.bc.edu/ec-c/S2004/771/NickellEM81.pdf>). However, this bias disappears in datasets with many time periods. In our analysis we have 15 years of quarterly data, so it is unproblematic to include lagged capex.

Table 4. Econometric analysis of the relationship between prices and competition – high GDP countries

	(1)	(2)	(3)	(4)	(5)	(6)
DEPENDENT VARIABLE	log(ARPM)	log(ARPM)	log(ARPM)	ARPM	log(ARPM)	log(ARPM)
HHI	0.09 (0.10)	0.09 (0.09)	-	0.00 (0.00)	0.01 (0.02)	-
4 PLAYER DUMMY	-	0.00 (0.02)	-0.01 (0.02)	-	-	-0.00 (0.01)
2G NETWORK DUMMY†	-	-	-	-	-	-
3G NETWORK DUMMY	0.00 (0.02)	0.00 (0.02)	0.00 (0.02)	0.00 (0.00)	0.02 (0.01)	0.02*** (0.01)
4G NETWORK DUMMY	-0.03* (0.01)	-0.03* (0.01)	-0.02* (0.01)	-0.00* (0.00)	-0.01 (0.01)	-0.01 (0.01)
% PRE-PAY CONNECTIONS	0.02 (0.02)	0.02 (0.02)	0.03 (0.02)	0.02 (0.02)	0.01* (0.01)	0.01* (0.01)
GDP PER CAPITA (IN PPP TERMS)	0.09 (0.07)	0.09 (0.08)	0.10 (0.08)	0.00 (0.00)	0.04** (0.02)	0.04** (0.02)
SUBSCRIBERS	-0.00 (0.04)	-0.00 (0.04)	0.00 (0.04)	-0.00 (0.00)	-0.01 (0.00)	-0.01 (0.00)
LAGGED ARPM	0.83*** (0.03)	0.83*** (0.03)	0.84*** (0.03)	0.67*** (0.09)	0.95*** (0.02)	0.95*** (0.02)
NUMBER OF OBSERVATIONS	1,993	1,993	1,993	1,993	1,993	1,993
R ² ††	0.87	0.87	0.87	0.81	0.95	0.95
TIME FE	Yes	Yes	Yes	Yes	Yes	Yes
MNO FE	Yes	Yes	Yes	Yes	No	No
METHODOLOGY	FE	FE	FE	FE	OLS	OLS

Source: Frontier Economics based on GSMA database
 Figures in parentheses indicate robust standard errors
 *** p<0.01, ** p<0.05, * p<0.1; † omitted because MNOs in the sample have had 2G networks in place throughout the period; †† R² values are not comparable between FE and OLS models
 Regressions (1), (2), (3) and (5) are log-log models with all non-dummy variables in logarithmic form

Discussion of anti-competitive effects in recent merger cases

Indonesia

During its assessment of the 2005 merger between XL Axiata and Axis, the Competition Commission found that consolidation would be beneficial for consumers because the market was too fragmented at the time, meaning available spectrum was split inefficiently. It also found that

Axis would likely go bankrupt absent the merger.

We understand that XL Axiata committed to remain a price leader in the market. As a result, the Commission considered that there were unlikely to be coordinated effects.

Chile

The Chilean court found that the 2005 merger between Movistar and BellSouth could lead to a high HHI, but recognised that HHI does not represent a perfect measure of the potential for anti-competitive effects.

differentiate between on-net and off-net pricing due to barriers to switching and spectrum asymmetries. The court also found that the merged entity would be dominant in the fixed line market, and that there may therefore be limited competition for bundled products. Finally, the court was concerned that the merger could lead to coordinated effects.

However, the court was concerned that the merged entity may have an incentive to

Argentina

The competition authority concluded that the 2005 merger between BellSouth and Movistar could lead to unilateral effects. It found that the merged entity's market share and the market HHI would be high, and that there was not sufficiently strong evidence to suggest that the merging parties were not close competitors. The authority ultimately concluded that competitors had sufficient market shares and spectrum to be able to respond to a potential increase in prices as a

result of the merger. However, it found that the merging parties may be able to set termination rates that would disadvantage competitors.

The competition authority ultimately concluded that coordinated effects would be unlikely because competition took place across several product dimensions and there were asymmetries in spectrum utilisation.

Table 5. Econometric analysis of the relationship between prices and competition – low GDP countries

	(1)	(2)	(3)	(4)	(5)	(6)
DEPENDENT VARIABLE	log(ARPM)	log(ARPM)	log(ARPM)	ARPM	log(ARPM)	log(ARPM)
HHI	0.19 (0.13)	0.21* (0.12)	-	-0.00 (0.00)	-0.01 (0.04)	-
4 PLAYER DUMMY	-	0.01 (0.03)	-0.02 (0.03)	-	-	0.01 (0.01)
2G NETWORK DUMMY†	-0.00 (0.08)	-0.00 (0.08)	0.02 (0.08)	-0.03** (0.01)	0.07 (0.08)	0.07 (0.08)
3G NETWORK DUMMY	0.03 (0.03)	0.03 (0.03)	0.04 (0.03)	-0.01 (0.01)	-0.00 (0.02)	-0.00 (0.02)
4G NETWORK DUMMY	-0.01 (0.03)	-0.01 (0.03)	-0.00 (0.02)	0.00 (0.00)	-0.02 (0.02)	-0.02 (0.02)
% PRE-PAY CONNECTIONS	0.00 (0.12)	0.01 (0.12)	0.01 (0.12)	0.15*** (0.05)	0.07 (0.05)	0.07 (0.05)
GDP PER CAPITA (IN PPP TERMS)	-0.30*** (0.10)	-0.29*** (0.12)	-0.40*** (0.14)	-0.00 (0.00)	0.00 (0.01)	0.00 (0.01)
SUBSCRIBERS	-0.01 (0.04)	-0.01 (0.04)	-0.01 (0.04)	-0.00 (0.00)	-0.01** (0.00)	-0.01** (0.00)
LAGGED ARPM	0.64*** (0.07)	0.64*** (0.07)	0.66*** (0.07)	0.23 (0.16)	0.98*** (0.01)	0.98*** (0.01)
NUMBER OF OBSERVATIONS	1,117	1,117	1,117	1,117	1,117	1,117
R ²	0.84	0.84	0.84	0.68	0.97	0.97
TIME FE	Yes	Yes	Yes	Yes	Yes	Yes
MNO FE	Yes	Yes	Yes	Yes	No	No
METHODOLOGY	FE	FE	FE	FE	OLS	OLS

Source: Frontier Economics based on GSMA database
 Figures in parentheses indicate robust standard errors
 *** p<0.01, ** p<0.05, * p<0.1; † R2 values are not comparable between FE and OLS models
 Regressions (1), (2), (3) and (5) are log-log models with all non-dummy variables in logarithmic form

IT IS UNCLEAR THAT MOBILE MERGERS WILL LEAD TO PRICE INCREASES

Overall, the results of our econometric analysis suggest that:

- There is no clear relationship between the level of competition and prices in three and four player markets. This is illustrated by the fact that the level of competition is not significant in the vast majority of specifications.
- This conclusion is robust to the assumptions that we make about the relationship between

price and its explanatory factors, as illustrated by the sensitivity tests carried out around our preferred specification.

- Other factors appear to be important for determining prices. In particular, past prices are an important determinant of current prices, while the influence of other factors varies depending on wealth.

Our preferred price relationship

Relationship (1) is our preferred specification for the following reasons (as set out in our analysis of the relationship between competition and investment).

- The Fixed Effects (FE) model is likely to provide a better fit than the Ordinary Least Squares (OLS) model. The FE model controls for unobserved differences across countries and MNOs, which may be significant for emerging markets. This means that the estimated relationships solely rely on variation in competition over time and not across countries.
- We consider HHI to be a more appropriate measure of the level of competition than a four

player dummy. This is because HHI reflects the competitive landscape more accurately than an indicator of the number of players. Moreover, in an FE model, the dummy captures the effect of a change in the number of players within a country only.

- Converting data into logarithmic form reduces the impact of outliers on the results and is a common approach to econometric analysis.

Analysis of the residuals produced under relationship (1) suggests that there are no obvious outstanding systematic factors that influence prices. In particular, Figure 24 suggests that these residuals fluctuate randomly around zero.

Figure 24

Residuals under our preferred relationship (1)



Source: Frontier Economics

3.3 Coordinated effects are unlikely in mobile markets

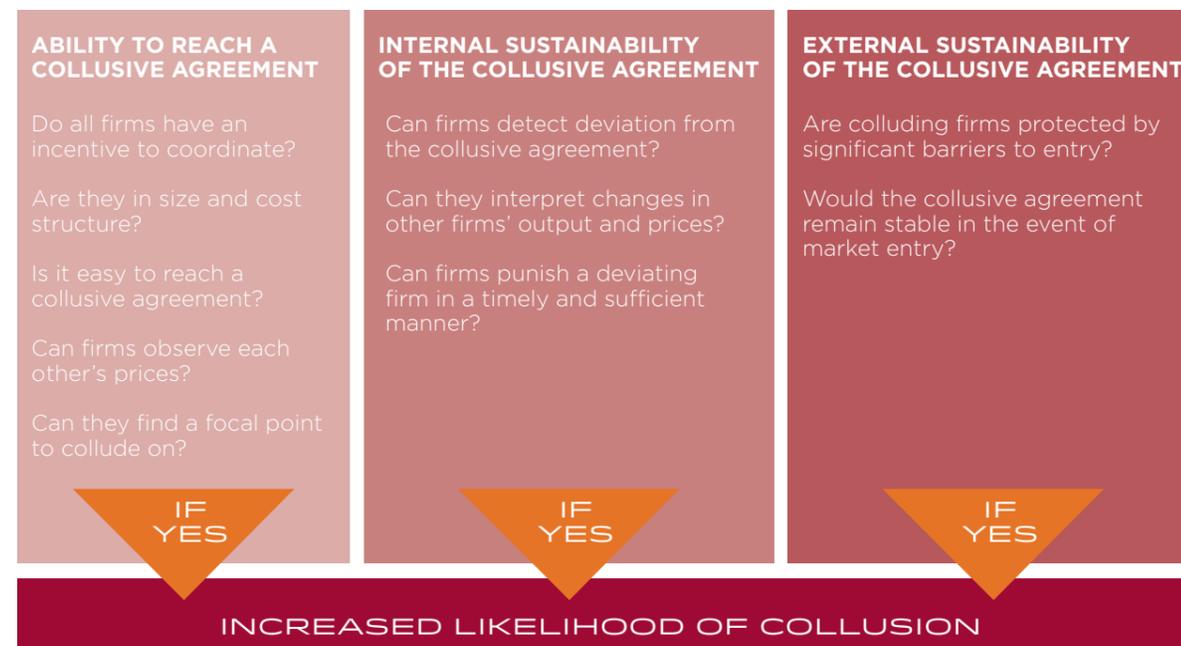
The authorities in El Salvador and Indonesia were concerned about the likelihood of coordinated effects arising from the mobile mergers. However, we consider that coordination is difficult to establish and may be particularly difficult to maintain in emerging mobile markets due to particular characteristics of the market. Competition authorities in a number of developed markets have investigated allegations that mobile operators are coordinating their activities but have found it extremely difficult to establish that conditions exist which would allow this to occur.

Firms can either try to coordinate on their prices and/or quality. Coordinated effects are more likely to occur in markets where it is relatively simple to reach a common understanding on the terms of coordination, meaning that there is a focal point

for the coordination.²³ In addition, the following two conditions must be met for coordination to be sustainable:

- The tacit agreement must be internally stable amongst the coordinating firms. This means that firms must be able to monitor, to a sufficient degree, whether the terms of coordination are being adhered to, and there must be some form of credible deterrent mechanism that can be utilised if deviation is detected.
- The tacit agreement must be externally stable, i.e. customers and competitors that are not members of the coordinating regime are unable to undermine the results expected from the coordination.

Figure 25
The conditions required for coordinated effects



Source: Frontier Economics

Coordination could occur at either the retail or the wholesale level. In the following sections, we assess the potential for coordination at both levels against the framework set out above.

23. In this document we treat tacit collusion and coordinated effects/coordination as synonyms.

IT IS UNCLEAR THAT MOBILE MERGERS WILL LEAD TO PRICE INCREASES

3.4 The retail market

Mobile operators are likely to be unable to reach a coordinated agreement at the retail level for several reasons.

Firstly, the market is typically too complex for tacit collusion to occur. In the post-pay segment, coordination would require operators to reach an agreement across a large number of tariffs. These tariffs are complex, vary across operators and evolve over time. In particular, there are often a large number of different post-pay tariff plans which can be priced in different ways. For example, operators can vary the up-front versus monthly cost, or offer different out of bundle prices. Post-pay contracts also contain many dimensions. For instance, some provide international minutes while others do not and operators in several emerging markets compete using mobile banking services.

Given that customers can switch between pre-pay and post-pay contracts, the complexity of the post-pay market suggests that it would be difficult to reach a coordinated agreement in the pre-pay segment too. In any case, there are a large number of general dimensions that consumers take into account when choosing a mobile operator, such as network quality, brand, services offered and customer service.

Secondly, differences between operators make reaching a tacit agreement difficult. In particular, there may be significant variation in operators' shares of different segments, underlying network costs, the extent of distribution networks and retail offerings. In emerging markets, there tends to be more variation in the size of players – more 'asymmetry' – than in developed countries (see section 1.1.6).

Thirdly, the market is not sufficiently transparent for tacit collusion to occur. There is frequently a lack of transparency in the pre-pay segment. The effective price is not observable due to variations in on-net and off-net usage between operators. Moreover, there is a lack of transparency in the post-pay segment due to the frequency with which operators offer tailored discounts during

private interactions with existing and potential customers, and the limited ability of rivals to obtain information on these discounts.

Finally, the dynamic nature of the market makes reaching a coordinated agreement more difficult. Data usage and smartphone penetration are increasing rapidly but, in many emerging markets, overall uptake of mobile services is also still increasing. It is widely recognised to be very difficult for firms to coordinate in a market where demand is expanding, as is the case in many emerging mobile markets. We note that concerns about coordination in mobile markets in developed countries only arose once these markets had become saturated.

To be internally sustainable, a collusive agreement requires sufficient retaliatory measures to be available to operators in the event of any deviation from the agreement. Operators may not have incentives to implement retaliatory measures, such as price wars, if they destroy profits or if it affects their position in other segments. Even if operators had an incentive to retaliate, this also requires that they are able to monitor each other's behaviour and recognise any deviations.

However, monitoring a coordinated agreement may be difficult due to the lack of transparency in retail mobile markets and the dynamic nature of these markets, as discussed above. In particular, effective pre-pay prices cannot be effectively monitored, other than by (i) tracking headline tariff changes; and (ii) using survey data and other sources to track customer switching behaviour. These forms of monitoring are unlikely to be fully effective in detecting any deviation from a collusive outcome.

Moreover, there is uncertainty in the outlook for the mobile sector regarding cost and revenues from rapidly increasing usage of data services, the growing importance of competing Over-The-Top (OTT) services (e.g., Skype, WhatsApp) and the volatile evolution in the adjacent market for smartphone devices.

IT IS UNCLEAR THAT MOBILE MERGERS WILL LEAD TO PRICE INCREASES

3.4.2 The wholesale market

Competition authorities in developed markets have typically focussed on the potential for operators to prevent MVNO access as evidence of coordination. However, it is unlikely that mobile operators would be able to reach or sustain such a coordinated agreement. Moreover, MVNO entry is less common in emerging mobile markets today. This may be because there are other barriers to entry, such as the requirement to first obtain an operating licence from the public authorities. It may also be because the market is at an earlier stage of development, with the network operators being focussed on gaining a share of new subscribers entering the market for the first time, rather than using MVNOs to target particular segments. MVNOs entered the US and many European markets at least 10 years after the first mobile services had been introduced. A lack of MVNOs in some emerging markets today may simply indicate that they are at an earlier stage of development, rather than being evidence of a coordinated agreement amongst the network operators.

In any event, negotiations with MVNOs and the specific access tariffs discussed are not transparent. Access tariffs are negotiated bilaterally, which makes monitoring difficult, if not impossible. It would not be clear to any operator whether other operators were undertaking negotiations, or the terms discussed in any such negotiation. They would only know once an operator had agreed an MVNO deal and when that deal was announced.

Secondly, once MVNO entry has been granted by a deviating firm, the coordinating firms would have a limited ability to punish the deviating firm. This is because it is very difficult to reverse MVNO entry once it has occurred, and to revert to the long-term equilibrium of upstream coordination. Moreover, the negotiations with access seekers tend to take a considerable amount of time (many months, or even years), which makes timely and efficient punishment unfeasible for operators. This subsequently reduces the incentive to collude to prevent wholesale entry by MVNOs in the first place.

Finally, there may be significant asymmetries in the cost base of MNOs. This would give each operator different incentives to compete and coordinate, as the respective benefits from each strategy will differ. Moreover, the negative effect of MVNO entry, arising from cannibalisation of retail revenues, is likely to impact the operators differently, depending on their retail market shares and their relative strengths at targeting different customer segments. These asymmetries would therefore make sustaining a coordinated agreement of MVNO access foreclosure difficult.

3.5 The position of small players may be unsustainable

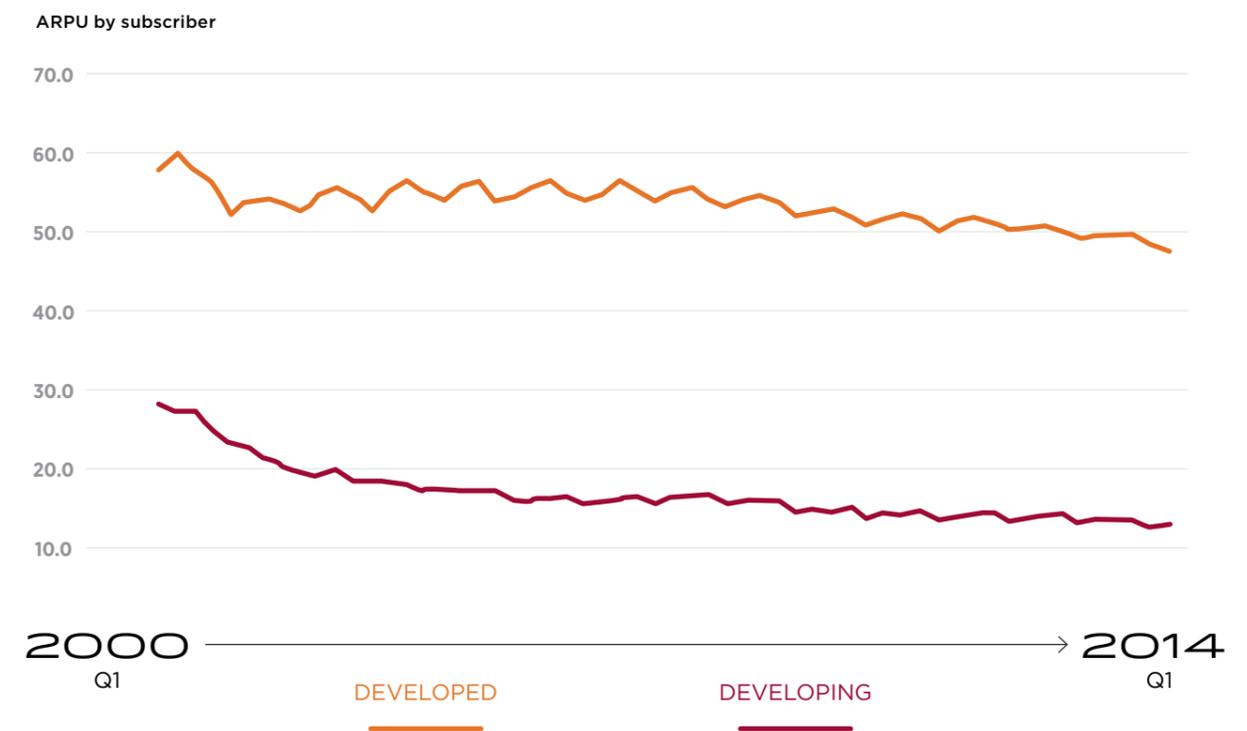
Mergers in emerging markets are often likely to be either a four-to-three merger involving two sizable players or a merger involving a smaller player. Competition authorities have tended to place a considerable focus on the role of small players in increasing competition in mobile markets. However, this focus may overstate the importance of small players going forwards.

The assumption is that these new entrants and small players drive price reductions and retail innovation and therefore their position in the market must be protected, as it is beneficial for competition and consumer welfare. Although small players may have, in some cases, performed this role in the past, it is not clear that they will continue to do so.

As shown in Figure 8, a greater number of emerging markets have smaller players than in the developed world (although in both cases, the number of players with a share of less than 5% is often zero). This may be in part because emerging markets have seen more recent entrants. In emerging markets in particular, low ARPUs (as shown in Figure 26) mean that scale is a very important factor. Operators without sufficient scale will not be able to invest in equipment which is likely to be purchased at global prices. It is therefore unlikely that small players would be able to continuously drive innovation or price reductions.

Figure 26

ARPU is lower in emerging markets



Source: GSMA Intelligence

IT IS UNCLEAR THAT MOBILE MERGERS WILL LEAD TO PRICE INCREASES

IT IS UNCLEAR THAT MOBILE MERGERS WILL LEAD TO PRICE INCREASES

In Indonesia, the authority considered that one of the merging parties was a failing firm that would otherwise have exited the market altogether, which made it more willing to approve the merger. We agree that mergers involving failing firms may be beneficial for competition in the mobile market. Failing firms will face the choice of exiting the market or raising prices in order to increase revenues, which will also worsen the competitive situation.

Small operators and failing firms are unlikely to get significant financing from elsewhere, and in

If small operators are currently making low margins, this may deter them from significant investments in future. Since consumer welfare in the future is likely to be influenced heavily by investment at the network level (in order to improve service quality), small players may not have a strong role to play, as they will not have the means or incentives to invest in excess network capacity.

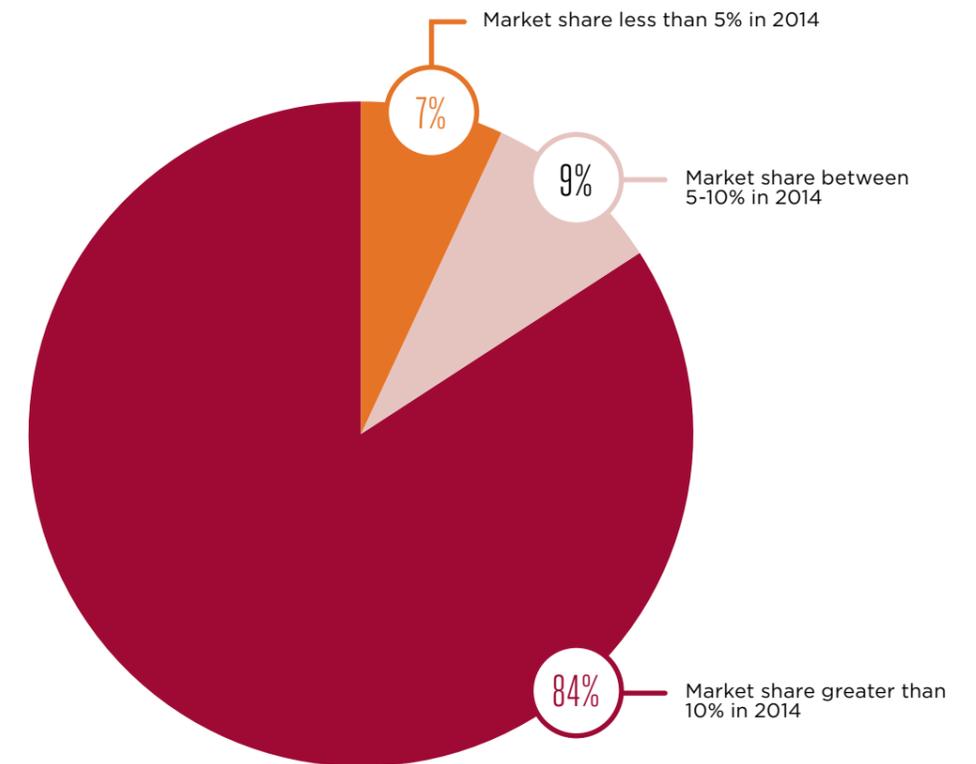
emerging markets the ability to attract investment will be lower than in the developed world, which is likely to be less risky.

A merger involving a failing firm will result in synergies which will reduce the costs of the merging parties, and lead to a larger subscriber base, allowing sufficient revenues for the merged party to invest in improving services without necessarily raising prices. This is likely to foster greater competition with the other remaining operators in the market, as the merged entity can become a more effective competitor.

Figure 27 shows that only 16% of all small players in emerging markets, with less than 5% market share in 2009, had a share of over 5% by 2014. Moreover, only 9% had grown to have a share over 10%. Although there are cases of operators having grown their market share after 5 years of operation, some small players in emerging markets are unlikely to grow significantly and therefore their ability to offer a competitive constraint is limited.

Figure 27

Operators in developing markets with less than 5% market share in 2009



Source: Frontier Economics based on GSMA Intelligence

Note: analysis based on a sample of 59 countries with at least one operator that had a market share off less than 5% in 2009. In total, the sample includes 128 such operators.

4 Remedies aimed at reallocating spectrum may not be necessary

In several of the merger decisions that we have reviewed (Argentina, Chile and El Salvador²⁴), the competition authorities required spectrum divestment as a condition of them approving the merger.

24. The operators were not willing to accept spectrum divestment in El Salvador.

Although such remedies may be appropriate in some cases, we consider that they should be considered carefully because they could potentially undo some of the potential benefits resulting from mergers. In particular, spectrum reallocation could undermine the investment incentives of the merging parties and thereby lead to worse consumer outcomes. Spectrum divestment could also lead to the under-utilisation of resources. Reallocation is typically a time-consuming process during which the spectrum is not fully utilised. Consumer benefits could be reduced further if spectrum is allocated to a

new entrant that may not be able to provide an effective competitive constraint in the market.

The rest of this section is structured as follows:

- In section 4.2, we explain why spectrum divestment could undermine the investment incentives of the merging parties; and
- In section 4.3, we set out why spectrum divestment could lead to the underutilisation of resources.

4.1 Investment incentives of the merging parties could be undermined

There is a risk that spectrum divestment could undo part of the positive impact that mergers could have on investment. This is a potential concern given the significant importance of investment, as discussed in section 2.3.

Operators will only make investments in coverage and capacity if such investment is profitable. The profitability of such investments will, to a considerable extent, be influenced by how rapidly other operators are likely to match such investments. If other operators can quickly match the investments of the merging party, then this may undermine the investment case in the first place. This provides a reason why trying to ensure that spectrum holdings are very symmetric in a market may be bad for investment.

When launching new technologies, operators may be able to re-farm existing spectrum. They may be in a better position to do this with a

larger spectrum holding as a result of a merger. Therefore, a greater availability of spectrum may allow the merged party to launch a new technology earlier than they would otherwise have been able to. We note that a number of emerging markets are yet to launch 4G. This will clearly be a reflection of a number of factors, but a lack of available spectrum may be one possible reason.

There are also likely to be some efficiency gains from spectrum aggregation, particularly when spectrum is scarce. Some services such as LTE typically require at least 10MHz of contiguous spectrum to work effectively. Even for existing technologies, it is likely that an increase in the amount of contiguous spectrum in a given band will have a more than proportionate increase in capacity. This is particularly valuable given the rapid increase in data usage that it is expected in mobile markets.

4.2 Spectrum divestment could lead to the underutilisation of resources

If authorities decide to re-allocate spectrum following a merger, they can either re-allocate it to an existing operator or set it aside for a new entrant. This is likely to be a time-consuming process. Often the spectrum will not be re-allocated until an upcoming auction. In the period before the spectrum is re-allocated, the merged party will not take this spectrum into account in its investment decisions. This is likely to lead to an underutilisation of spectrum, which is a scarce resource. A further reason why reallocating spectrum may take time is that the spectrum will need to be freed up.

If the spectrum ends up in the hands of a new entrant, it is not clear that this new entrant would necessarily provide a strong competitive force on the market. For it to be an effective competitor, it is likely to require a considerable amount of spectrum. Therefore, the weakening of the merged entity due to the spectrum divestment may not be justified if the new entrant does not have a beneficial impact on the market.

Annexe 1: merger decisions in case study countries

This annexe provides more detail on the analysis that competition authorities carried out to assess the case study mergers, and information on the market context at the time of the mergers.

Indonesia

In 2014, the Competition Commission in Indonesia approved a five-to-four merger between XL Axiata, the second largest operator, and Axis, the smallest operator. In the following sections,

we explain the Commission's competition assessment, its stance on efficiency gains and its approach to remedies.

Table 6. Indonesia - key facts at time of merger

INDICATOR	
MERGER APPROVED	Q4 2013
MERGING OPERATORS	XL Axiata and Axis Telecom
NUMBER OF OPERATORS	5 to 4
ARPM	\$0.02
SHARES BEFORE MERGER (CONNECTIONS)	
SHARES AFTER MERGER (CONNECTIONS)	
OVERALL PENETRATION	124.31%
CAPEX PER SUBSCRIBER	\$7.01
EBITDA MARGIN	46.74%
POPULATION	251,338,938
GDP PER CAPITA	\$3,475

Source: GSMA Intelligence

Market definition

The Commission defined separate markets for:

- mobile telecommunications services²⁵, which included mobile communications and interconnection services; and
- tower rental services.

The competition framework in Indonesia requires that any merger for which the post-merger HHI is above 1,800, and the change in the HHI is above

Anti-competitive effects

In its assessment of the market for telecommunications services, the Commission concluded that the merger would not have an anti-competitive effect. It noted that Indonesia had the highest number of operators in the region (7 operators excluding the FWA operators)²⁶. It therefore considered that consolidation would be beneficial as the market was too fragmented, meaning that the available spectrum had to be split between many operators. When analysing financial information, it stated that only two of the existing operators were profitable, with the remaining five operators making losses. In particular, it considered that Axis would be likely to go bankrupt absent the merger, as it had significant losses, growing debt and negative cash flows. The Commission did state that further entry into the market may be unlikely due to high entry barriers (the need to acquire spectrum and high sunk costs), but did not view this as a concern given the number of operators that were already in the market.

Efficiency gains

The Commission concluded that the merger could give rise to efficiency gains, which would benefit consumers in terms of better quality of service, improved network quality and lower prices. It considered that efficiency gains could arise due to:

150, should be investigated further. For the mobile telecommunications services market, the HHI before the merger was 2,653 compared to a post-merger HHI of 2,904 (the market share of XL was 19.59% and the market share of Axis was 6.41%). The Commission therefore decided to investigate this market in more detail. For tower rental services, the impact of the merger on the HHI was only above the threshold in Yogyakarta Province, so only this province was analysed in more detail.

The Commission considered that, in principle, the reduction in the number of players may lead to coordinated effects. However, we understand that XL Axiata committed to remain a price leader in the market. Therefore, the Commission decided that the best approach was to allow the merger, but monitor the market post-merger.

For the tower rental services market, the Commission concluded that in the province that it analysed in more detail, it was unlikely that there would be anti-competitive effects. This was because it considered that entry barriers into this market were low, based on an analysis of the regulations governing the use of towers. It also stated that switching barriers are low for tower rental. When analysing the potential for coordinated effects, it concluded that this was unlikely due to the competitive nature of the market.

- more efficient use of spectrum;
- economies of scale due to a reduction in network costs; and
- economies of scale due to a reduction in overheads such as human resources and marketing.

25. It concluded that Fixed Wireless Access (FWA) was in a different market.

26. It concluded that Fixed Wireless Access (FWA) was in a different market.

26. It concluded that Fixed Wireless Access (FWA) were in a different market.

26. Although five of these operators accounted for the vast majority of subscribers.

We also understand that the two smaller operators use CDMA technology.

Remedies

The only remedy that the Commission imposed was requiring the merged entity to produce quarterly reports for a period of three years on the development of the mobile market, as well as

on their products and tariffs. It also noted that ex-post competition policy would still apply following the merger.

Chile

In 2005, the Chilean court approved a four-to-three merger subject to spectrum divestment. The merger was between Movistar, the largest operator, and BellSouth, the smallest operator²⁷.

In the following sections, we explain the authority's competition assessment, its stance on efficiency gains and its approach to remedies.

27. The market shares of the largest and second largest players are similar, so Movistar may appear to be the second largest operator under some measures. This also applies to the third and fourth largest operators.

Table 7. Chile - key facts at time of merger

INDICATOR											
MERGER APPROVED	Q1 2005										
MERGING OPERATORS	Movistar and BellSouth										
NUMBER OF OPERATORS	4 to 3										
ARPM	\$0.18										
SHARES BEFORE MERGER	<table border="1"> <caption>Market Shares Before Merger</caption> <thead> <tr> <th>Operator</th> <th>Share (%)</th> </tr> </thead> <tbody> <tr> <td>Movistar</td> <td>35%</td> </tr> <tr> <td>EnTel</td> <td>34%</td> </tr> <tr> <td>Claro</td> <td>16%</td> </tr> <tr> <td>BellSouth</td> <td>15%</td> </tr> </tbody> </table>	Operator	Share (%)	Movistar	35%	EnTel	34%	Claro	16%	BellSouth	15%
Operator	Share (%)										
Movistar	35%										
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Operator	Share (%)										
Movistar	50%										
EnTel	34%										
Claro	16%										
OVERALL PENETRATION	34.37%										
CAPEX PER SUBSCRIBER	\$2.85										
EBITDA MARGIN	34.44%										
POPULATION	16,295,372										
GDP PER CAPITA	\$7,615										

Source: GSMA Intelligence

Discussion of remedies in recent merger cases

Indonesia

In its investigation of the 2014 merger between XL Axiata and Axis, the Competition Commission required the merging parties to produce quarterly

reports for a period of three years on the development of the mobile market, their products and their tariffs.

Chile

The Chilean court required Movistar and BellSouth to divest 25MHz of spectrum in the 800MHz band

as a condition for approving the merger between the two operators in 2005.

Argentina

In 2005, the competition authority asked BellSouth and Movistar to divest 35MHz of spectrum as a pre-requisite for approving the

proposed merger. It also required the merging parties to refrain from using call termination charges to exclude competitors from the market.

El Salvador

In 2011, the competition authority asked Claro to divest 20MHz of spectrum as a condition for approving a merger with Digicel. However, the

merging parties declined to do so, and the merger was blocked.

Source: Frontier based on publicly available documents

Market definition

The court defined a single market for mobile services, which included different technologies (CDMA, TDMA and GSM). It decided that fixed services were not in the same market because

many consumers used both services and, because the two services had different pricing structures, they did not offer mobility. It defined a national market for mobile services.

Anti-competitive effects

To assess the potential anti-competitive effects from the merger, the court primarily focussed on market shares, the HHI, spectrum allocations and barriers to entry. The merger would create a new market leader with a market share of 49.4% in terms of subscriber numbers (Movistar and BellSouth had market shares of 31.4% and 18% respectively pre-merger). The next largest competitor would be Entel (market share of 35.3%) followed by Claro (market share of 15.3%)²⁸.

own 30MHz, whilst Entel would own 60MHz and Claro would own 30MHz. The court noted that there were no immediate plans for additional spectrum to be made available for mobile services, so the spectrum asymmetry would not correct itself without intervention.

The court considered that there were high entry barriers to the mobile sector. This was predominantly because of the need to acquire spectrum, but also because of the high sunk costs of entering the market.

The court calculated the pre- and post-merger HHIs. As a result of the merger, the HHI would increase from 2,789 to 3,920. The court noted that based on the US Department of Justice horizontal merger guidelines, both the absolute post-merger HHI and the change in HHI would be considered as high. However, the court did state that the HHI does not represent a perfect measure of potential anti-competitive effects and also explained that the HHI is typically high in mobile markets, as shown by other countries.

At the time, there were some barriers to switching in the market, as there was no mobile number portability and there were issues with handset compatibility given that the operators used different technologies.

The court considered that the merged entity may have an incentive to differentiate between on-net and off-net pricing, which could have an anti-competitive effect.

The court was particularly concerned about how the merger would impact the spectrum allocations across the remaining operators. In Chile, the 800MHz and 1900MHz bands were being used to deliver mobile services at the time of the merger. Movistar and BellSouth each held 25MHz of spectrum in the 800MHz band. Therefore, the merged entity would own 100% of the spectrum in the 800MHz band post-merger. This was considered particularly problematic given that the 800MHz band has better propagation characteristics than the 1900MHz band and is therefore better for offering coverage. In the 1900MHz band, the merged entity would

A further concern discussed by the court was that Movistar was considered to hold a dominant position in the fixed market. The court considered that this may make it difficult for other operators to compete, as the merged entity would be in a strong position to offer bundled products. Given all of the above factors, the court considered that the merger could give rise to unilateral effects. In addition, due to the reduction in the number of players and the high combined share of the merged entity and Entel, it also stated that the merger could lead to coordinated effects.

28. The courts also calculated market shares based on outgoing traffic volumes.

Efficiency gains

The court concluded that there were likely to be significant economies of scale associated with the merger. It tried to quantify the reduction in equipment needed due to economies of scale. It also considered that the merger could lead to a significant reduction in overhead costs.

The court considered that it was possible that the efficiency gains would be passed onto consumers.

Remedies

The court required that the merged entity divest 25MHz of spectrum within the 800MHz band.

This had to be done through a competitive bidding process within 18 months of the merger.

Argentina

In 2005, the Argentine competition authority cleared a four-to-three merger between Bellsouth, the smallest operator, and Movistar, one of the largest operators. In the following sections, we

explain the authority's competition assessment, its stance on efficiency gains and its approach to remedies.

Table 8. Argentina - key facts at time of merger

INDICATOR	
MERGER APPROVED	Q1 2005
MERGING OPERATORS	Movistar and BellSouth
NUMBER OF OPERATORS	4 to 3
ARPM	\$0.07
SHARES BEFORE MERGER	<ul style="list-style-type: none"> ■ BELLSOUTH ■ CLARO ■ MOVISTAR ■ PERSONAL
SHARES AFTER MERGER	<ul style="list-style-type: none"> ■ CLARO ■ MOVISTAR ■ PERSONAL
OVERALL PENETRATION	38.56%
CAPEX PER SUBSCRIBER	\$2.45
EBITDA MARGIN	16.52%
POPULATION	38,563,085
GDP PER CAPITA	\$5,768

Source: GSMA Intelligence

Market definition

The authority defined a number of markets for the purposes of the competition assessment. In this section, we discuss the assessment of the mobile market, which is defined as mobile communications (including voice, SMS, data and related services). The authority took the standard approach to competition assessment, defining the relevant product market, geographic market, then assessing the competition in these markets (both unilateral and coordinated effects) before defining remedies.

The mobile market in Argentina in 2004 was comprised of five mobile operators. The country was originally split into three regions (Region I: north, Region II: AMBA and Region III: south) for the purpose of issuing licences. Therefore the first

Anti-competitive effects

The authority assessed the potential for horizontal unilateral effects at the retail level, considering the position of the merging parties and the closeness of competition. The assessment was based on market shares, HHI and qualitative analysis. Overall, the competition authority concluded that there was no strong incentive to increase prices as a result of the merger.

As mentioned above, the merging party had a combined share of users of 41.9%. The authority found that the HHI associated with this was 2,446 and 3,285 after the merger, which was deemed to be a relatively high concentration. This was true for the country as a whole and in each of the three regions.

The parties argued that they were not close competitors as Bellsouth had a higher share of post-pay and corporate 'affluent' customers than the other brands. The authority deemed that this could be influenced by the fact that Bellsouth was the first operator in the AMBA area and this type of customer is typically the first to purchase mobile services, and therefore may not be a feature of Bellsouth's brand. The authority found that there was some product differentiation in the Argentinian market but not a large amount. They surmised that it could not be accepted that

operator to enter the market differed between these regions, although subsequently licences were issued which covered the whole country and all the operators extended to operate in all three areas. The merging parties together had a turnover share of 47% in 2003, and a share of 41.9% of users in 2004. The share of Bellsouth had been steadily dropping prior to the merger, falling from 23% in December 2001 to 16.51% in November 2004. The parties' shares were not consistent across the three regions, with a much lower combined share in the north of 14.4%.

The authority chose to consider the effects on the whole of Argentina as well as considering each of the regions separately.

the parties were not close competitors, but the analysis was not conclusive in either direction.

The authority suggested that a 42% share of users could lead to an excess of market power by the merged entity, which could result in price increases or deterioration in the quality of product offerings. They concluded, however, that competitors in the Argentine mobile market did not appear to be constrained in their ability to respond competitively. The scarce resource in the market is spectrum, and the competitors had enough spectrum to respond to any changes made by the merged party. In addition, the merging party was required to give up excess spectrum (amounting to 35MHz) due to legislation limiting each mobile operator to 50MHz of spectrum.

There were no strong concerns about the merged parties' gains from network effects as the other competitors were deemed to have significant shares and therefore network imbalances were not too pronounced.

Therefore, despite the level of concentration implied by the merger, the authority considered that alternative operators had the ability to react to potential price increases and the merged entity was limited by the spectrum legislation.

The authority also considered the potential for coordinated effects as a result of the merger. They considered that the likelihood of coordinated effects increases if there is product homogeneity, information flows and absence of effective competitors.

With regard to the homogeneity of products, they found that competition takes place in the market, based not only on price but also on other dimensions such as the introduction of new services and handsets, technological innovation, and the variety of plans. Given these features, the establishment and maintenance of a tacit or explicit agreement would be difficult to sustain.

Regarding the flow of information, whilst it is high due to a large amount of information made public by the market operators, this was not seen to be an element of concern as the existence of competition through various competitive variables makes it difficult to sustain a price agreement.

Furthermore, the authority considered that the merged entity would have to serve a large number of customers with no more than 50MHz of spectrum, whereas the two main competitors CTI and Personal had a lower number of customers to serve with a similar amount of spectrum. The share of Bellsouth was also declining over time and other competitors improved their competitive position as a result.

Accordingly, with regard to potential horizontal competitive effects, the authority concluded that there were no elements to suggest that

Efficiency gains

There were no apparent arguments made with regard to efficiency or investment

Remedies

As mentioned above, the remedies involved the divestment of 35MHz of spectrum and a

after the merger the parties, either unilaterally, or in coordination with other competitors, had the incentive and ability to increase prices or impair competition through some other non-price effects.

The authority also considered the potential for competitive effects at the wholesale level. The wholesale markets were considered to include roaming and call termination.

With regard to roaming, there were no major concerns about anti-competitive effects as the parties faced competition in the roaming market in which they operated, meaning that the incentive to deny network usage was reduced substantially. Guidelines require that operators offer roaming on a non-discriminatory basis.

For call termination, the provision was made that parties should refrain from call termination rates that would disadvantage competitors. It was recommended that mobile termination rates were set following the interconnection regulation.

With regard to spectrum, the parties were limited by legislation capping the amount of spectrum holdings to 50MHz. As a result, they were required to return 35MHz of spectrum.

The authority noted that there was no set time period for the transition and the divestment of the spectrum. They advised that this time must be minimised to avoid the parties benefiting from reduced costs and an expanded ability to provide services in the transition period.

effects of the merger.

requirement to refrain from using call termination charges to exclude competitors from the market.

Table 9. Uganda - key facts at time of merger

INDICATOR													
MERGER APPROVED	Q2 2013												
MERGING OPERATORS	Airtel and Warid Telecom												
NUMBER OF OPERATORS	4 to 3												
ARPM	\$0.08												
SHARES BEFORE MERGER	<table border="1"> <caption>Market Share Before Merger</caption> <thead> <tr> <th>Operator</th> <th>Share (%)</th> </tr> </thead> <tbody> <tr> <td>Airtel</td> <td>26%</td> </tr> <tr> <td>MTN</td> <td>44%</td> </tr> <tr> <td>UT Mobile</td> <td>11%</td> </tr> <tr> <td>Warid</td> <td>16%</td> </tr> <tr> <td>Others</td> <td>3%</td> </tr> </tbody> </table>	Operator	Share (%)	Airtel	26%	MTN	44%	UT Mobile	11%	Warid	16%	Others	3%
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Operator	Share (%)												
Airtel	41%												
MTN	44%												
UT Mobile	11%												
Others	4%												
OVERALL PENETRATION	48.71%												
CAPEX PER SUBSCRIBER	\$1.17												
EBITDA MARGIN	36.86%												
POPULATION	37,578,876												
GDP PER CAPITA	\$572												

Source: GSMA Intelligence

Uganda

In 2013, the Uganda Communications Commission (UCC) approved a four-to-three merger between Airtel, the second largest operator, and Warid, the third largest operator, without any imposing any

remedies²⁹. Warid had entered the market in 2010, which was considered to have led to a reduction in prices.

The UCC considered that the merger could have a positive impact on competition by creating a stronger rival for MTN who was the market leader. Following the merger, MTN and the merged entity would have a similar number of subscribers.

population than Rwanda, it still had a similar number of market players.

The UCC also stated that further entry into the Ugandan mobile market was still a possibility. It argued that despite having a much larger

The UCC considered that the merger could lead to an increase in service quality. Prior to the transaction, the UCC had been concerned that service quality had been declining due to a lack of investment³⁰.

El Salvador

The proposed merger between Claro and Digicel was initially approved by El Salvador's competition authority in 2011, subject to spectrum divestment. However, this proposed remedy was not accepted by the merging parties.

merger was blocked. The authority took the view that there was a high probability that the merger, if approved, would lead to an adverse impact on the level of competition in the markets for fixed and mobile telephony, and would result in the elimination of Digicel as a maverick.

A new merger request was submitted in 2012, in which the parties appealed to the authority to reconsider the merger and the conditions imposed on the merging parties. This time, however, the

In the following sections, we explain the authority's competition assessment, its stance on efficiency gains and its approach to remedies.

29. In general, there is little information in the public domain about how the authority assessed the merger.

30. <http://www.independent.co.ug/business/business-news/7748-airtel-warid-merger-shakes-market>

Table 10. El Salvador – key facts at time of the blocked merger

INDICATOR	
MERGER REJECTED	Q3 2012
MERGING OPERATORS	Claro and Digicel
NUMBER OF OPERATORS	4 to 3
SHARES	<p>A pie chart illustrating the market share distribution among five operators. The segments are: CLARO (29%, dark red), DIGICEL (15%, grey), MOVISTAR (20%, light orange), TIGO (35%, orange), and OTHERS (1%, black). A legend to the right of the chart identifies each operator with a corresponding color square.</p>
OVERALL PENETRATION	138.04%
POPULATION	6,308,159
GDP PER CAPITA	\$3,782

Source: GSMA Intelligence
 Note: data on ARPM, capex per subscriber and EBITDA margin not available

Market definition

The authority considered four markets to be relevant to the merger. It defined fixed and mobile services to be separate markets, but recognised the potential for substitutability between them. For example, it concluded that from the point of view of consumers, mobile services are a substitute for fixed line services, but not vice versa. The authority also defined wholesale and retail services to be separate markets, but considered that off-net calls provide a link between the two.

The authority therefore considered four separate, but linked, markets:

- wholesale mobile voice call termination market;
- wholesale fixed voice call termination market;
- retail market for fixed narrowband telephony services; and
- retail mobile service market (including voice, SMS, MMS and data services).

The authority found that there were nine operators in these markets at the time of the merger, four of which were horizontally integrated companies that provided both fixed and mobile services. Claro and Digicel were active in both fixed and mobile markets.

Anti-competitive effects

In its assessment of potential anti-competitive effects, the competition authority analysed the degree of competition in the market by considering market shares and HHI data, barriers to entry, spectrum allocations, and the closeness of competition between the merging parties.

In its final decision, the authority concluded that legal, economic, structural, strategic and technical barriers deter market entry. In this regard, it took the view that the then current market players were not subject to the threat of market entry from potential competitors.

Moreover, based on the analysis of HHI data, the authority considered that the relevant markets for both fixed and mobile services were highly concentrated and would continue to be so following the merger. Specifically, the retail mobile service market was regarded as highly concentrated (based on commonly used international standards)³¹. The authority calculated that the market concentration would increase by 796 points if the merger were cleared. The authority also stressed that in both the fixed and mobile services markets, the merged entity would have a market share of over 50%, resulting in very high market concentration.

Regarding spectrum allocation, the authority was particularly concerned that the merged entity would own more than half of the spectrum allocated to mobile. This would increase the chances of its exercising market power that could be detrimental to consumers. Moreover, the authority took the view that the merged entity may have an incentive to engage in strategic discriminatory behaviour such as

predatory pricing. The authority considered that this could lead to players exiting the market, and could make market entry and expansion more difficult for other operators. Therefore, the competition authority concluded that it would be more efficient if the current shares of spectrum remained administrated by each party concerned (Claro and Digicel) separately.

The authority also noted that Digicel had historically acted as a maverick in the mobile service market, stimulating competition by offering lower tariffs and other promotions and benefits to consumers. It was concerned that the removal of this competitive force could have an adverse impact on the level of competition in the relevant markets.

The authority further considered that the merger could lead to coordinated effects. This view was based on the authority's assessment that the analysed markets were susceptible to collusion. The authority referred to the US Federal Trade Commission's Horizontal Merger Guidelines, which state that coordination may be more likely if operators have high market shares and a history of coordination (with no significant market changes since). The authority noted that the merging parties had previously been investigated for coordinating their behaviour.

In this respect, the authority concluded that the proposed merger would facilitate the concentration and stability of coordinated agreements by reducing the number of competitors in both the fixed and mobile services markets and eliminating Digicel as a maverick.

31. The competition authority in its assessment relied on indices used by the Spanish Competition Commission (Comisión Nacional de la Competencia).

Remedies

The authority initially required spectrum divestment to clear the merger. Specifically, Claro was asked to relinquish 20MHz of its spectrum to retain the existing level of competition in the mobile service market. However, the merging

parties refused to accept this remedy and resubmitted the merger case in 2012, asking the authority to revoke its prior decision. However, this appeal was dismissed by the authority based on its competition assessment.

Efficiency gains

The merging parties argued that the merger would lead to spectrum efficiencies that would be passed on directly to consumers. The parties claimed that the proposed merger would lead to cost reductions and that the savings realised would be reinvested in, for example, new and faster technologies, improving the service received by consumers.

The authority considered that the claimed efficiency gains were difficult to verify and that it was not likely that the efficiency gains would be passed on to consumers. Moreover, the authority was of the view that the merging parties could realise the efficiency gains without the merger by investing in new technologies.



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