

# Mobile-Only is Dead, Long Live Convergence!

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**Abstract:** Fixed and mobile convergence is driving the development of telecom services across Europe, and is becoming increasingly attractive to end users.

Convergence is the result of significant synergies between fixed and mobile service provision by telecommunication operators.

If the fixed market is competitive, the benefits of those synergies are returned to customers. If not, mobile offers may be cross-subsidised. In both cases, operators offering mobile-only services are displaced and their viability is in question. Regulatory intervention on the fixed market is only clearly justified if the market is not competitive.

**Key words:** convergence, mobile-only, sustainable market structure, regulatory policy

European Commission policy does not believe Fixed-Mobile Convergence is worth taking into account in relation to merger control, where it is seen as not sufficiently significant<sup>1</sup>, nor in relation to telecom network regulation, where mobile is still only considered as a potential substitute to fixed and not as a complement<sup>2</sup>.

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\* The views expressed in this article are those of the authors and may not represent those of Orange.

<sup>1</sup> Merger Procedure Regulation (EC) 139/2004, with CASE M.7637 Liberty Global / BASE Belgium, where the risk of foreclosure is directly linked to the market share of fixed to mobile convergent offers: page 86 (391) "A significant number of mobile stand-alone subscribers therefore remains, which makes it unlikely that mobile-only players would be foreclosed".

<sup>2</sup> In the explanatory note accompanying the document Commission Recommendation on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation of October 2014, p. 22, the EC only considers the relation between fixed and mobile from the angle of potential substitution : "Fixed-mobile substitution sufficient to identify a single access market is not foreseen on a Union level for the forthcoming period covered by this Recommendation, but it is likely that more NRAs will indeed be able to conclude that such substitution exists in their national markets".

This article challenges this analysis and concludes that (a) fixed and mobile are now complements rather than substitutes, (b) the take-up of Fixed-Mobile convergence will drive the evolution of telecom markets' activity in the coming years, threatening the survival of mobile-only providers, and (c) that policy makers should strike the right balance between encouraging the achievement of efficiencies resulting from fixed-mobile convergence and maintaining effective competition in the convergent market.

More precisely this article proves that the telecom market is evolving towards convergence and that this evolution is very robust (part 1). Driven by technological evolution leading to synergies between mobile and fixed infrastructure (part 2) and triggered by competition leading to customers benefiting from those synergies as offers match their complementary demand for fixed and mobile services (part 3), convergence leaves very little space for mobile-only operators to remain competitive and, in the long run, to survive (part 4). Initial evidence of this structural change is now clearly visible in market structure evolutions (part 5). As current and future trends, in particular the emergence of 5G, merely confirm these transformations (part 6), we will underline the challenge facing regulatory authorities to find the right approach, so that the efficiencies from convergence can be achieved without impairing competition (part 7).

### **Methodology**

This empirical analysis was conducted by using published company data to support our description of market trends. As this method relies heavily on data crunching resources made up of very recent information, several research reports from financial analysts were used to gather information. These sources were supplemented by statistical information provided by public authorities and published results from econometric analyses of fixed-mobile demand. Research by financial analysts was also used to confirm our analysis, giving a broader view on market trends with their assessment of the behaviour of companies and markets and we have been careful to use various independent sources.

Banks' financial analyses exploit all the financial information published by listed firms, which have legal obligations of transparency and of accuracy *vis-à-vis* their stakeholders, so that capital can be efficiently allocated. The required level of details aims to provide enough insight for capital allocation

or fundraising, and facilitate decision-making to support management strategy. This information is public, and it is transparent in the sense that the reasoning and the hypothesis are explicit. It is part of a contradictory process, as several views on the same topic can be compared.

For these reasons we consider these sources as reliable, transparent, objective and relevant for the purpose of our analysis, which concerns telecom market structures and more specifically the interaction between fixed and mobile market structures when fixed mobile convergence operates.

Furthermore, other quantitative sources could not be used for this purpose, because of their limitations:

- Costs and revenue figures used by operators within their internal controlling processes are confidential. In addition, they support many day- to-day operating decisions at microscopic level but are useless for supporting structural decisions concerning firms as a whole,
- Regulatory accounting data do not cover all the activities of regulated firms, merely the activities related to regulated assets. Moreover, they use specific regulatory accounting conventions, for instance to calculate the costs of a "hypothetical efficient operator", which do not represent the costs of actual firms.
- National and international statistical data provided by public institutions do not provide information at firm level, only at industry level. Moreover, the data is often 2 or 3 years old before being published, whereas financial analysts react within days or weeks of new information on the market. This speed is crucial in a fast-moving market.

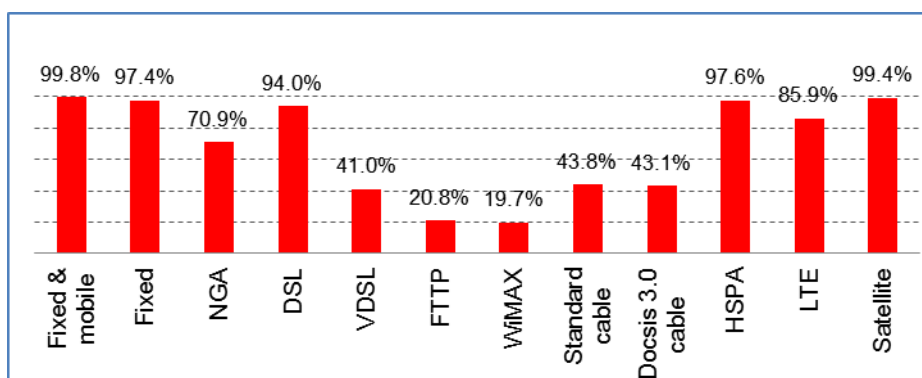
## ■ Fixed-mobile convergent offers are of growing importance in the evolution of telecom markets

Statistics provided by the EC show that fixed and mobile connectivity is widely available in Europe. In this context, even if mobile-only customers remain a significant part of the market, the general trend towards take-up of quadruple play offers is transforming the landscape.

### Fixed and mobile telecom services are available almost everywhere in Europe

In its European Digital Progress Report 2016, the EC makes the point that basic broadband is available to everyone in the EU, when considering all major technologies (xDSL, cable, fibre to the premises (FTTP), WiMax, HSPA, LTE and Satellite). Fixed and fixed-wireless technologies cover 97% of EU homes. In addition, NGA technologies (VDSL, Cable Docsis 3.0 and FTTP) capable of delivering download speeds of at least 30 Mbps are available to 71%, whereas 4G mobile (LTE) coverage reached 86% of the EU population at the end of June 2015, a seven percentage-point increase in a year. It is a fact that fixed and mobile connectivity is available for most of the EU population without restriction.

Figure 1 - EU telecom coverage by technology – June 2015



Source: Europe's Digital Progress Report 2016 - IHS and VVA

In this context, the EC finds, in the same report, that 72% of EU homes and 93% of companies had a fixed broadband subscription in 2015. Mobile penetration (voice or data) at EU level was 137.7% in 2015.

### Mobile-only customers are a minority in Europe

The European Commission mandates surveys (called Eurobarometer) to better understand the adoption of electronic communication services by

European households<sup>3</sup>. In October 2015, the proportion of EU28 households which had at least one mobile phone and no further subscription to a landline phone for voice telephony was 33%. This rate varies considerably across Member States, with values ranging from above 80% of households in Finland (87%) and the Czech Republic (84%), to 15% of households in the Netherlands, Luxemburg and Germany. This statistic is solely related to voice telephony (PSTN or VoIP) and does not encompass broadband subscriptions for internet access without a voice plan. It therefore represents a strong upward bias inflating the mobile-only proportion in electronic communication services adoption.

Despite the fact that according to this Eurobarometer's research the proportion of mobile-only households has increased by 15 percentage points since 2005, with particularly high growth rates during the last period in Germany and Romania (+7 pp. between January 2014 and October 2015), some countries have experienced a reverse trend, including Slovakia (- 4 pp. between January 2014 and October 2015), Ireland (-7 pp. over the same period), Portugal (- 5 pp. over the same period), etc. On average only 33% of the European residential market relied on mobile-only telecoms services for voice communications in October 2015 versus 31% in January 2014 and the proportion is expected to be nearly 0% for the Enterprise market<sup>4</sup>.

Another method for tracking mobile-only customers involves comparing the statistics provided by the EC on the percentage of households benefiting from a broadband connection, with the percentage of households benefiting from a fixed broadband connection. On average in 2016, 82.88% of EU28 households had a broadband connexion, and 73.77% of them had a fixed broadband connection; in other words, only 10.98% of European households had a mobile-only broadband connection in 2016.

To further illustrate this statistic, in Finland where the Eurobarometer shows that 87% of households had a mobile-only connection for voice communications, the percentage of Finnish households with a broadband connection stands at 91.2%, and the percentage with a fixed broadband connection is 61.1%. Therefore, in 2016, the mobile-only broadband connection in Finland was 33%, which is the highest score amongst the 28 European Union countries.

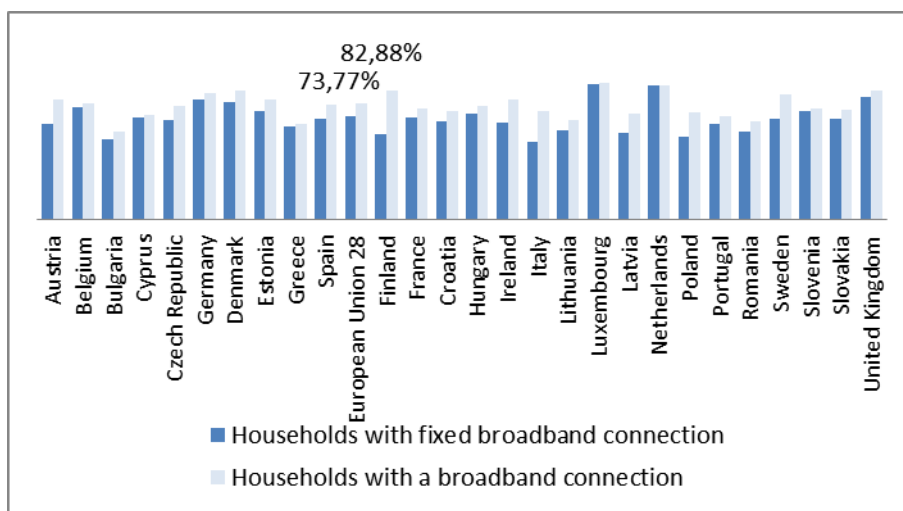
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<sup>3</sup> EUROBAROMETRE

<http://ec.europa.eu/COMFrontOffice/publicopinion/index.cfm/Survey/getSurveyDetail/yearFrom/2014/yearTo/2017/search/communication/surveyKy/2062>

<sup>4</sup> No surveys or research found on that subject.

Figure 2 - Households with a broadband connection in the EU – 2016



Source: Europe's Digital Agenda Scorecard

A TNS Sofres independent survey on the French market (containing a panel from all operators as well as MVNOs) shows that from early 2014 until the end of Q1 2016, this upward trend of mobile-only customers started reversing in France, with a decreasing proportion of mobile subscribers now mobile-only for voice services. At the end of Q1 2016, 12% of French people over the age of 15 only had a mobile number to call or to be called.

This research characterizes mobile-only customers relative to other customers:

- Mobile-only customers are over-represented among the young, with half of them between 18 and 34 years old, while the proportion is a quarter for all customers.
- Students are over-represented (20% of students are mobile-only, vs 12% for the overall population) as are higher managerial and professional occupations.
- Differences in urbanization rates have little impact, even though people living in urban areas are over-represented (mainly in the Paris region).
- 31% of single-person households are mobile-only.

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**High growth of fixed-mobile convergent offers in major European telecom countries**

On the other side of the telecom landscape in terms of service aggregation, the most dynamic sub-segment is quadruple play subscriptions.

The launch of fixed-mobile bundles is relatively new across Europe, with the first quadruple play offers available in 2010:

- Orange: OPEN launched in August 2010
- Telefonica: Fusión launched in October 2012
- Portugal Telecom: Meo launched in January 2013
- Deutsche Telekom: Magenta Eins launched in September 2014
- Telenet: Wigo launched in June 2016
- Proximus: Tuttimus launched in October 2016

Only 4 years after Fusión was launched, Telefonica reported in its financial communication for Q4 2016 that in the Consumer segment, "Fusión", with 4.33 million customers, accounted for 83.2% of its fixed broadband customers, 81% of its TV customers and 46.1% of its mobile contract customers. Also in Spain, 84% of Orange's fixed broadband customers had subscribed to a quadruple-play convergent offer at the end of Q4 2016 (+2 points in a year).

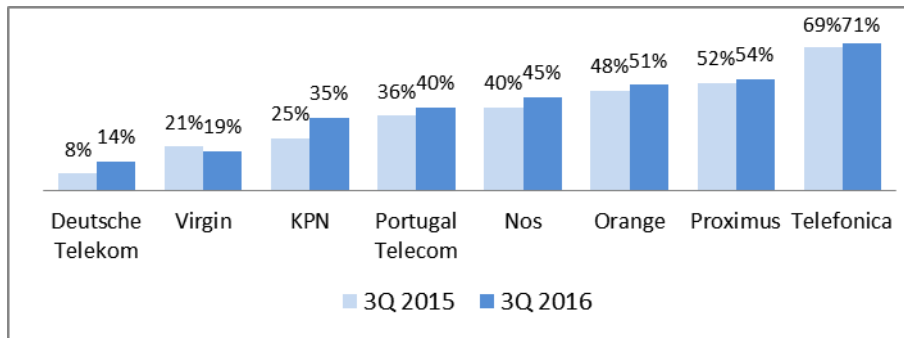
In France, Orange also reported in its financial communication for Q4 2016 that in France, 57% of its fixed broadband residential customers have a convergent offer, with an upward trend of + 3 points compared to the previous year.

In Germany, despite being a latecomer in terms of convergent offers, Deutsche Telekom already had 34% of its mobile contract customer base under Magenta Eins at the end of Q4 2016, versus 25% the year before.

In Poland, at the end of Q4 2016, almost 60% of Orange's mobile contract customer base had subscribed to convergent offers, with a +23% increase in a year.

In Belgium, Telenet sold 100,000 Wigo plans within the first 100 days after its launch...

This is a dramatic take-off that can be seen across Europe.

**Figure 3 - Quadruple-play penetration by operator in % of domestic DSL base – Q3 2016**

Source: Company data collected by Morgan Stanley - 07/02/2017

### Consumers' appeal for fixed-mobile convergent service

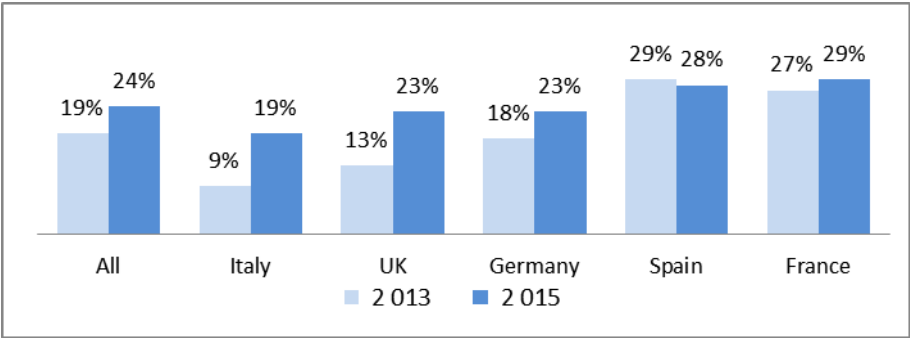
Analyzing the market for quadruple play using the number of customers is biased by the fact that offers are still limited in several countries. For this reason, it is interesting to look at the demand side of the market.

At end 2015, Berenberg produced a data-rich review of demand for converged service offerings, with a survey involving 5000 households (1000 each in Germany, France, the UK, Italy and Spain). This is a new edition of previous surveys - carried out in 2011 and 2013 - in which the aim was to assess the bundling market at that time, consumer awareness of bundling, the inclination to bundle and the drivers behind bundling (or not).

Berenberg's survey across Europe shows an increased demand for quadruple play, with 24% of households keen to subscribe to such offers, up from 19% in 2013. As multiplay offers multiply in a country, it becomes more likely that there is high demand for quadruple play.



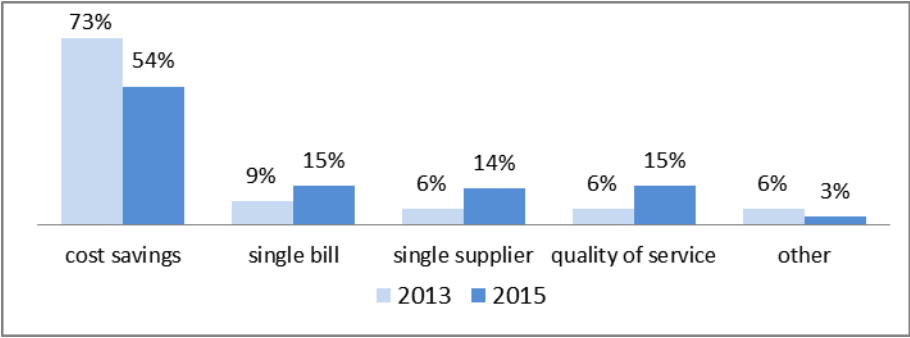
Figure 4 - % of households' demand for quadruple play offers



Source: Berenberg – 29/12/2015 Convergence to remain key in 2016

It is noticeable that the primary reason for households wanting to bundle lies in the cost savings. It is also very interesting that the percentage of households that chose cost savings as a primary reason for bundling is decreasing sharply over time, leading to an increase in more intrinsic reasons linked to the service itself: single bill, quality of service, one-stop shopping, etc. This firmly establishes quadruple play offers as a "must have" product in operators' portfolios.

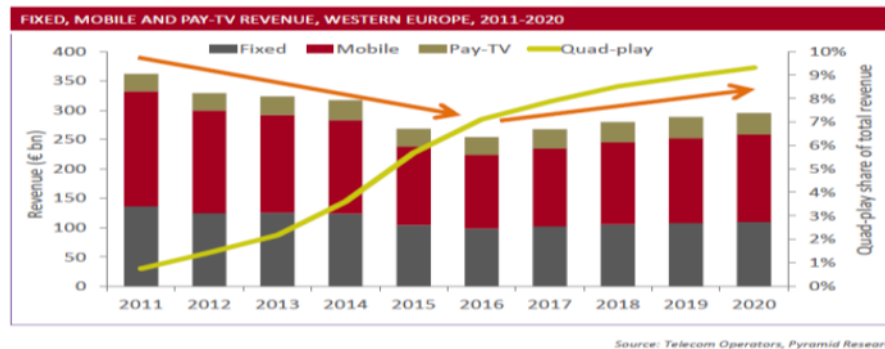
Figure 5 - Primary reason for bundling as expressed in survey of households



Source: Berenberg – 29/12/2015 Convergence to remain key in 2016

In its report "Latest Digital Consumer Insight" published in May 2016, Pyramid Research forecasts that the share of quadruple play offers in the total telecom revenues in Western Europe would continue to grow, from around 6% today to almost 10% by 2020.

Figure 6 - Forecast of quad play share of total telecom revenues



### Econometrical analysis confirms that fixed and mobile services have become complementary and no longer substitutes for consumers

In the early days of mobile, fixed and mobile voice services were complementary, as mobiles allowed calls which were not possible before and were priced significantly above those of fixed telephony.

With mobile voice priced at flat rate, mobile voice essentially became a substitute to fixed voice and the total volume of mobile voice started to equal and then overtake the volume of fixed voice.

However, mobile data consumption currently represents 2 to 3% of fixed data consumption. This means that mobile data usage cannot be considered as a valid general substitute for fixed data usages. *De facto* mobile usage and fixed usage tend to complement each other, as consumers sample and select on their mobile the content they will enjoy extensively on fixed.

This is confirmed by academic research. Based on a mixed logit demand estimation, Lukasz GRZYBOWSKI and Julienne LIANG (IEP 2015) found that, for mobile subscribers, mobile data was complementary to fixed-line broadband (whereas mobile voice was substitute). The authors stated that, "consumers can therefore use mobile data to sample online content and then they can complete online activity using fixed broadband at home, with no download limit. Thus, fixed broadband services provide a complementary value to mobile data services. Consumers who get fixed broadband access value having mobile data more and *vice versa*."

As fixed and mobile are complements, a quadruple play offer is more valuable to the consumer than its fixed and mobile components.

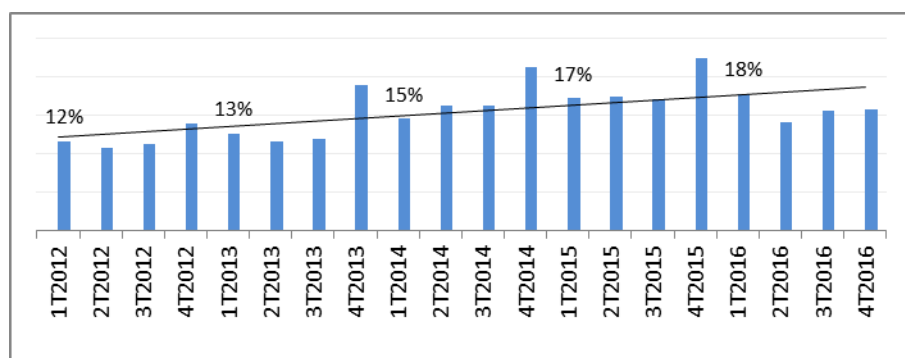
### ■ The evolution of technology leads to the convergence of mobile and fixed services, with significant synergies obtained for telecommunication operators

This trend towards quadruple play offers has its roots in the technological developments resulting in all-IP, making a unified network possible and leading to network related CAPEX and OPEX reduction. Commercial costs are also optimized as a result of cross selling and lower churn.

#### Synergies related to capital expenditure

The CAPEX-to-sales ratio for wireless operators has been increasing in recent years as operators have begun to accelerate their 4G network deployments. Areas of wireless spending have included network densification, capacity investments and a focus on addressing the bottleneck risk presented by mobile backhaul.

Figure 7 - Evolution of CAPEX/sales ratio of European mobile operators

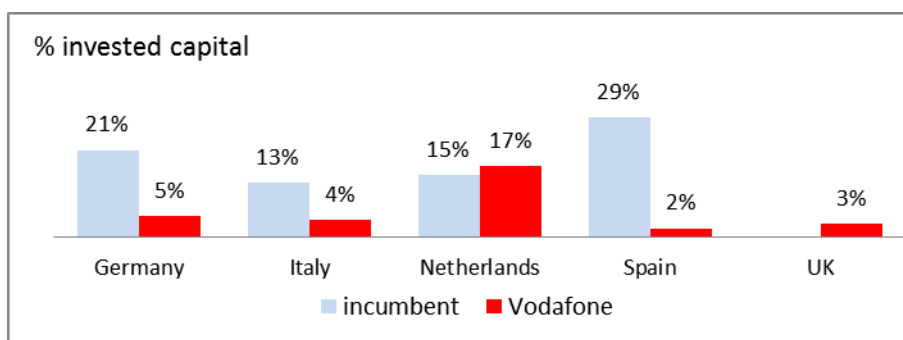


Source: Company data<sup>5</sup>

<sup>5</sup> The capex to sales ratio of European mobile operators results from the simple average aggregation of capex to sales ratio of main wireless operators from main Western European countries, as presented by the WCIS Quarterly Blended Selected Metrics' database.

JPMorgan conducted an analysis on CAPEX and return on investment by dividing its sample of company data into mobile activities of incumbent/convergent operators and mobile-only operators (namely Vodafone in the graph below). It shows higher returns on investment for mobile activities of incumbent/convergent operators than for mobile-only operators. According to the JPMorgan analysis, this is due to CAPEX synergies for convergent operators, while incumbent mobile operators tend to have much lower capital intensity than mobile-only peers, based on operator level CAPEX, depreciation and amortization disclosure. Indeed, JPMorgan states that "with mobile data usage now growing exponentially, mobile-only operators have begun to face an explosion in this variable lease cost and, hence, have taken steps to invest in deploying (fibre) backhaul of their own. Such structural inefficiencies, related to being mobile only, contribute to the significant difference in mobile ROICs between incumbents (who can leverage their fixed line infrastructure) and their mobile-only peers".

**Figure 8 - Euro wireless – mobile only ROICs are lower than those of convergent peers**



*Source: JPMorgan estimates, based on company data*

### **Synergies related to network operating costs**

The benefit is two-fold with fixed infrastructure capable of decongesting traffic in the mobile network:

- at the backhaul links level. It also enables alternative operators to avoid paying for the links leased from the incumbent operator,
- and at access level, by allowing a portion of the traffic on the fixed-line network to transit via Wi-Fi hotspots, to decongest the radio antennae.

As a recent example, Telenet provided information on its acquisition of BASE in April 2015 with the following sources of identified synergies<sup>6</sup>:

**Figure 9 - Telenet sources of synergies when acquiring BASE**

Key categories	Description	Run-rate (€m)
Opex and Capex Synergies	<u>Migration of Mobile Traffic</u> <ul style="list-style-type: none"><li>Migration of Telenet MVNO from Mobistar to BASE Company network while honoring the current Mobistar contract</li></ul>	<ul style="list-style-type: none"><li>Approximately €145 million<sup>1</sup> of opex synergies</li><li>Approximately €5 million of capex synergies</li></ul>
	<u>Network, IT and SG&amp;A</u> <ul style="list-style-type: none"><li>Integration of core and backhaul</li><li>Integration of IT platform</li><li>Optimise shop footprint</li><li>Rationalise combined marketing spend</li><li>Rationalise overlapping activities</li></ul>	
Total of approximately €240 million of one-off investment to prepare mobile network for Telenet Traffic and create best in class integrated communications provider, and integration costs, most of which will occur over the next few years		

These €145 million of annual OPEX-related synergies amount to 11.3% of the combined group's OPEX base. Just a year later in April 2016, this figure was updated to €220 million per annum until 2020, mainly due to higher mobile data usage from mobile customers (i.e. 17.2% of the combined group's OPEX base). Indeed, €150 million are linked to the migration of mobile customers from the full MVNO host network to the BASE network, and according to the company €50 million per annum over 5 years will come from the network, IT and SG&A (integration of core and backhaul, IT platforms, as well as shop footprint optimization and rationalized combined marketing spend).

This is fully consistent with Oddo estimates, that around 20% of OPEX can be affected by technological cost-cutting: "the technology-related synergies might also be substantial aside from IT (11% of an operator's OPEX) by addressing overlap in backhaul (3% of a mobile operator's OPEX), by using the operator's fibre for instance - rather than renting backhaul links from the incumbent - and the network core (5% of a mobile

<sup>6</sup> Slide 8 of the presentation

<http://investors.telenet.be/phoenix.zhtml?c=241896&p=irol-acqBase>

operator's OPEX via pooled equipment between fixed and mobile, particularly in routers) along with video platforms (CDN, etc.)" (Oddo Securities, October 2015)

### Synergies related to commercial operating costs

From a commercial point of view, convergent offers have been seen as value destructive, with operators' revenues and EBITDA shrinkage due to the discount offered to customers when bundling. Recent analysis is much more positive when considering the increase in enterprise value, stemming from the enhancement in the lifetime value of the quadruple-play client, as well as the upselling possibilities that it allows.

"Our estimates suggest that an average European operator that succeeds in selling convergent products to 50% of its base could boost its fixed/mobile EBITDA by more than 7%, from the lower wireless churn rate alone." (Morgan Stanley, December 2015).

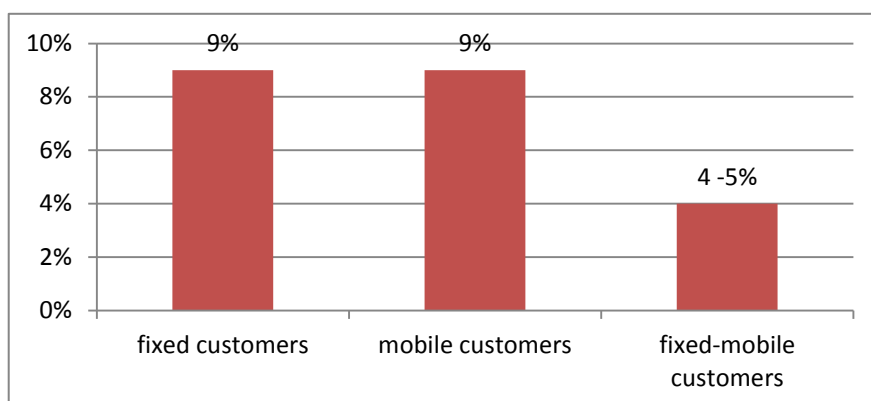
**Figure 10 - Re-rating of the implicit subscriber multiple thanks to quadruple play**

	<i>Mobile</i>	<i>Fixed</i>	<i>Total</i>	<i>Quadruple-play</i>
Annual ARPU	317	414	731	645
EBITDA	197	138	335	250
Churn	16%	14%		9%
Lifetime	6.3	7.1		11.1
DCF	887	689	1576	1722
EV/EBITDA	4.5	5.0	4.7	6.9

Source: Oddo Securities, October 2015

In its FY 2015/2016 financial report, Vodafone highlighted a reduction of churn thanks to fixed-mobile convergence, with 10% churn for fixed and mobile combined offers in Italy, compared with 21% churn for mobile-only offers; in Spain, churn of fixed and mobile combined offers reached 14% vs 26% for mobile-only offers.

Similar evidence is given by KPN in its financial report.

**Figure 11 - KPN customer churn in 2015**

Source: Company information

Another example is Telefonica: in its financial communication, the operator underlines continuous ARPU uplift thanks to the additional services included, as well as very low churn.

**Figure 12 - Telefonica customer ARPU and churn in 2015 & 2016**

	2015				2016			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Fusión ARPU (EUR)	68.6	71.3	73.8	73.2	78.2	79.8	81.8	81.6
Fusión churn	0.9%	1.4%	1.1%	1.1%	1.3%	1.1%	1.3%	1.4%

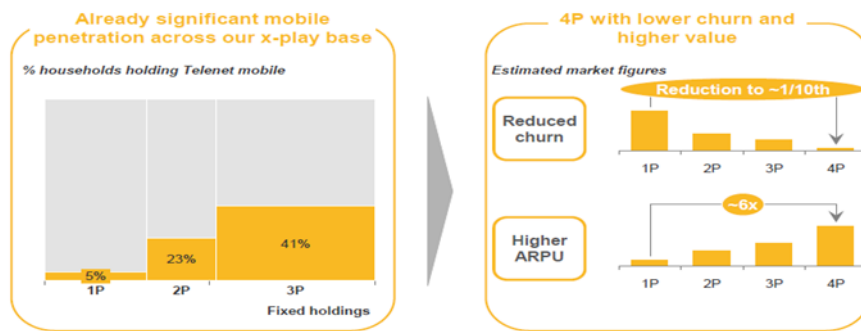
Source: Company information

On top of savings from churn reduction, convergence also means better staggering of support costs from billing, CRM, distribution costs, etc., with potential economies of scale.

### Cross-selling, upselling possibilities

Operators are mentioning in their communication not only a churn reduction of their mobile base when bundling, but also possibilities of cross selling products, and "offering more for more". In its Capital Market Day, Telenet presented the higher value of its quad play portfolio, compared to single play, dual play and triple play offers, as shown below:

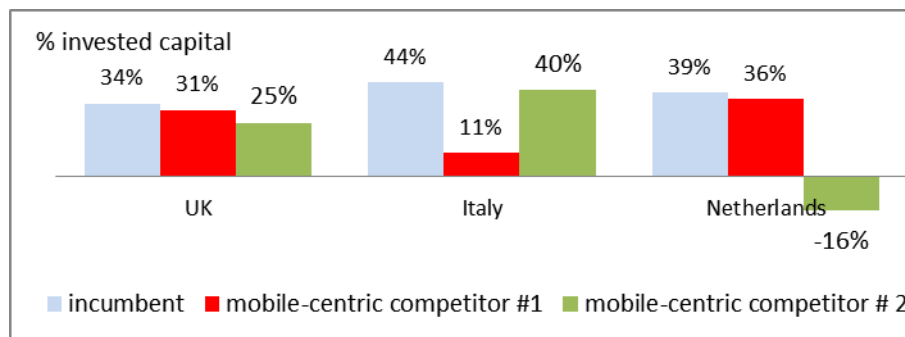
Figure 13 - Telenet presentation of convergence uplift



Source: Telenet Capital Markets Day, April 28, 2016

As a result of those OPEX synergies, as well as cross- and up-selling opportunities, the profitability of integrated operators appears to be higher than the profitability of mobile-only challengers, as shown in Figure 14.

Figure 14 - Comparison of EBITDA margin between convergent and non-convergent operators



Source: Company data gathered by HSBC, January 2017

## ■ In a competitive convergent market, benefits of those synergies are returned to customers

When more than one operator benefits from those synergies resulting from convergence in a given market, convergent offers are subject to fair competition. The condition is that the service is to be offered by operators benefiting from a fixed and a mobile cost-efficient infrastructure as well. Under this condition, those synergies are mainly re-distributed to customers,



with better value packages, either through discounts or new services generated by investments.

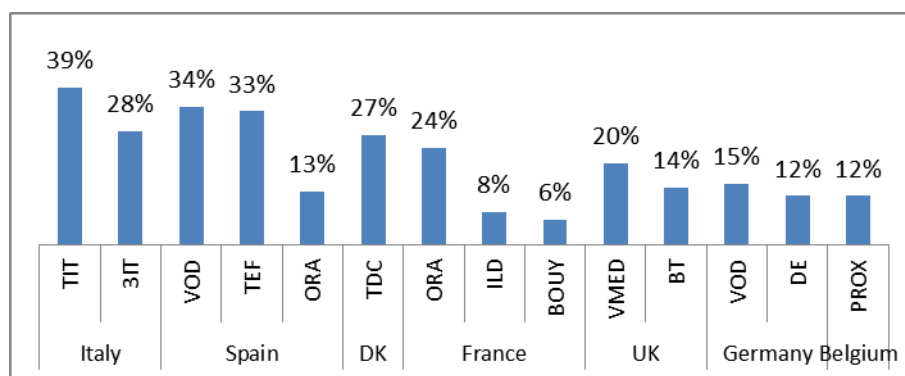
### Benefit to customers with price discounts on bundles

In countries where at least two convergent operators are competing, the discounts passed on to customers when bundling can be over 20%.

- In the UK, Virgin Media and BT are both convergent operators after the acquisition of EE.
- In Spain, Vodafone and Ono, Orange and Jazztel, as well as Telefonica are convergent operators.
- In Italy, the merger of 3 and Wind in August 2015 has created a powerful convergent operator to challenge TI.
- In Germany, O2 is a convergent operator, alongside DT and Vodafone, after the acquisition of Kabel Deutschland in 2013.
- In Denmark, Telenor and TDC are both convergent operators.
- In Belgium, Telenet became fully convergent after acquiring BASE in April 2015, alongside Proximus and Orange Belgium.

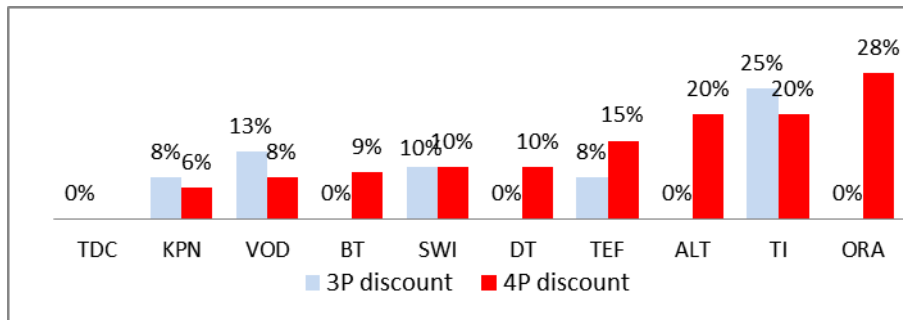
In those markets, price discounts on convergent offers compared to standalone services have been particularly strong, with, for example, incumbents in Italy and Spain offering discount in the range of 30% to 40%.

Figure 15 - Price discount on convergent offers from European operators



Source: Data from companies' websites gathered by Nomura Research – Nov 2015

Figure 16 - Price discount on convergent offers from European operators

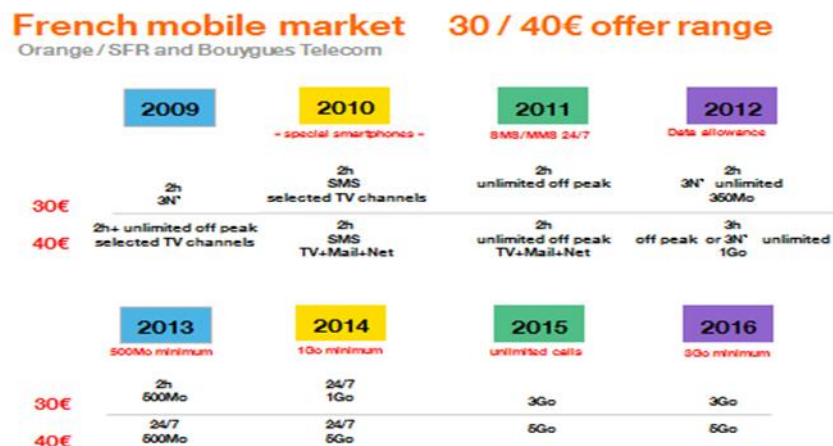


Source: Data from companies' websites gathered by HSBC – Jan 2017

### Benefit to customers with increased data allowances

Another benefit of convergence can be seen in offers with larger data allowances. The French market's middle range offers illustrates this phenomenon, we can see that the key differentiation feature between mobile operators over the last 5 years has been the data allowance: operators have been offering "more for more", with data allowances increasing from 350 MB to 3 GB.

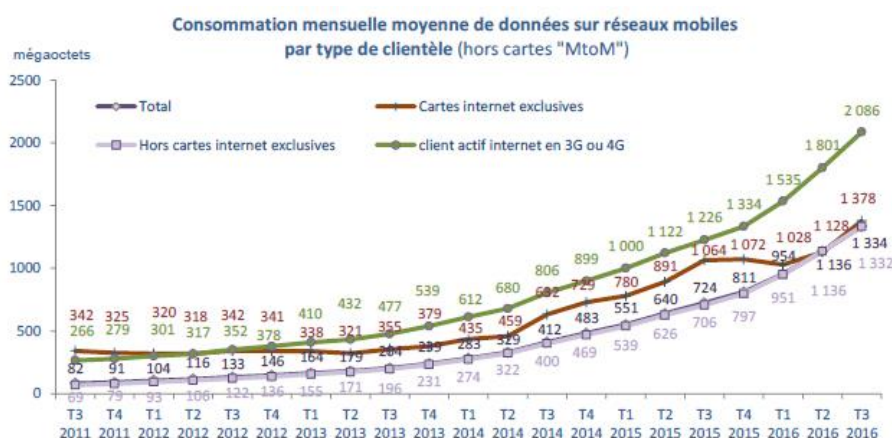
Figure 17 - Mobile offers' key features on the French market



Source: Companies' commercial catalogs gathered by Orange

This increase allows for more data consumption, as shown by the average monthly data traffic per SIM card reported by the French regulator over the period.

**Figure 18 - Average monthly data traffic per SIM card**



Source: French regulator ARCEP – quarterly statistics

Because of market dynamics when at least two convergent operators compete, synergies from convergence are returned to customers; offers from a pure mobile operator appear to be non-competitive for customers using both fixed and mobile services.

### **Benefit to customers with more CAPEX for increased quality and speed**

Consumer benefit may also result from increased investment by market players and indeed the sector's capital intensity has tended to increase in recent years.

Deutsche Bank<sup>7</sup> calculated the telco sector's capital intensity in Europe, as measured by the CAPEX to sales ratio. It found that telco sector capital intensity in Europe was approaching 19% in 2015, which is 3 to 4 pc? above the 15-year average. Such investment needs are also well illustrated by Vodafone's decision to raise its CAPEX expenditure to over 20% of sales for the last two years as part of its "Project Spring" programme.

<sup>7</sup> Deutsche Bank, December 2015

Another investment hike is foreseen with the introduction of 5G technology, for which the backhauling solution (that can be mutualized with the FTTH network of a convergent operator) is all the more important as the cells are small.

The current capital intensity is also similar to 2002 levels, when the sector had double-digit top line growth. It marks a 6 to 7 pc? increase from the recent low in 2011. For the same period in Europe, capital intensity in the wider market is broadly unchanged and consistent with the 15-year average of 7.5%.

Facing these operating conditions, convergence between fixed and mobile operations is a means to remain competitive.

## ■ Viability of mobile-only operators in Europe in question

As a consequence, it seems very hard indeed for a mobile-only operator to survive in a market where convergent operators are already competing.

Therefore, mobile-only operators are cornered into either addressing the limited sub market of mobile-only customers, or into offering fixed and mobile bundles via access to fixed infrastructure, that can be provided by another operator.

### Difficulty of only addressing part of the mobile telecom market

As seen in Part 1 "Mobile-only customers are a minority in Europe", only 11% of European households had a mobile-only broadband connection in 2016 (with an upper figure of 33% for Finland, and a lowest figure of 0.06% in the Netherlands); as far as Enterprise clients are concerned, this percentage is nearly nil. As a pure mobile operator addresses only a minority of the telecom market, it suffers from a potentially smaller base to cover the cost of its infrastructure. In its May 2009 recommendation on termination rates, the EC considers that the "efficient generic operator" on which all analysis is conducted, must have at least 20% market share in a country to be viable, due to the high proportion of fixed costs compared to the variable cost structure. It would mean that this pure mobile operator would need to capture more than the entire average mobile-only client base in Europe to remain viable - which is impossible.

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**Difficulty of addressing mobile-only customers**

The behaviour of mobile-only customers relative to the "average" mobile customer of an operator is not helping. Studies have shown that this population has a higher churn rate and a shorter lifetime, inducing higher commercial costs for operators, than average customers. What's more, their inclination to choose a lower-value offer is higher than the average population, diminishing the prospect of revenues.

Research on the French market covering the first months of 2016 provided the following results:

- willingness to churn is 7 points higher for mobile-only customers than for a mobile customer at 46% and mobile-only customers have on average 11 months less seniority in their current offer than mobile customers,
- 54% of mobile-only customers subscribe to a low-end offer, *versus* only 47% for mobile customers.

**Difficulty of remaining cost efficient**

A pure mobile operator will have a higher cost base and CAPEX intensity than the mobile component of a convergent operator, as it does not benefit from the network and customer care management synergies mentioned above. Therefore, it will not be as cost efficient as convergent operators to serve the mobile market in general.

On the mobile-only sub-market, it will compete with MVNOs, who benefit from optimized multi-sourcing deals from MNOs with potentially lower cost bases due to convergence.

For this reason, it is difficult to offer competitive mobile prices and to generate enough margin to face increasing CAPEX needs, as technological lifecycles shorten and spectrum auctions are quite demanding.

## ■ Evidence of market structure changes

Mobile operators are being caught between a rock and a hard place, at a time when strong M&A activity is taking place, even though companies are not always being given the green light by European competition authorities.

### Initial evidence of the impact of M&A activity is being seen by European mobile operators

In an environment marked by competition between at least 2 convergent operators in a country, synergies are mainly given back to customers, as seen in Part 2, and convergent operators are not generating abnormal profits. Due to the fact that they benefit from a more efficient cost base than mobile-only operators, the latter are not able to offer competitive mobile services.

This trend has already begun to show, as mobile challenger operators in Spain, France, Germany, Italy, Belgium and the UK together account for only 4.5% of sales, 4.5% of EBITDA and just 1.5% of operating FCF.

The sum of their future discounted cash flow (EBITDA less investment and tax) reveals a far lower amount than the capital engaged to build-up the assets. In other terms: it destroys value, paving the way to consolidation.

**Figure 19 - Weight of mobile challengers on their domestic base and M&A value across main European markets**

	<i>Bouygues</i>	<i>BASE</i>	<i>TRE</i>	<i>THREE</i>	<i>E-Plus</i>	<i>Yoigo</i>	<i>Total challengers</i>	<i>Total</i>	
Sales	4432	711	1739	2548	3260	831	13521	183932	7,4%
EBITDA	694	149	248	677	1001	68	2837	60076	4,7%
Capex	684	173	404	400	586	143	2390	29950	8,0%
EBITDA-Capex	10	-24	-156	277	415	-75	447	30126	1,5%
Discounted EBITDA	16667	2107	4910	11171	14157	958	49970		
Discounted tax	-1738	-362	-687	-2763	-3318	15	-8853		
Discounted Capex	-11400	-1011	-2828	-2797	-4102	-1002	-23140		
Value Stand alone	3529	735	1395	5610	6737	-30	17976	412056	4,4%
M&A Value	10000	1350	4500	8610	8600	750	33810		

Source: Company data gathered by Oddo Securities

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**Example of Vodafone – Access to fixed infrastructure**

Another example is given by the former "mobile centric" European operator.

In its FY 2015/16 financial report, Vodafone stated that the company was now offering converged services in all its key markets:

- in the UK, Vodafone addresses 83% of homes with NGN thanks to wholesale NGN,
- in Germany, Vodafone addresses 59% of homes with NGN, either with its own infrastructure thanks to its Kabel Deutschland acquisition in 2013, or through wholesale NGN,
- in Spain, Vodafone addresses 49% of Spanish homes with its own infrastructure thanks to the acquisition of the cable operator ONO in 2014. Vodafone also had an agreement with Orange to co-invest in FTTH so as to speed up deployment.
- in Italy, Vodafone addresses 29% of homes with NGN, either through its own infrastructure or a wholesale offer, thanks to an agreement with Enel.
- in the Netherlands, Vodafone currently addresses 26% of homes, and merged in February 2016 with Liberty Global to become fully convergent in this market.

With those moves, the last big European mobile player has widely become a convergent operator in the process of building its own fixed infrastructure mainly thanks to its acquisition of cable companies.

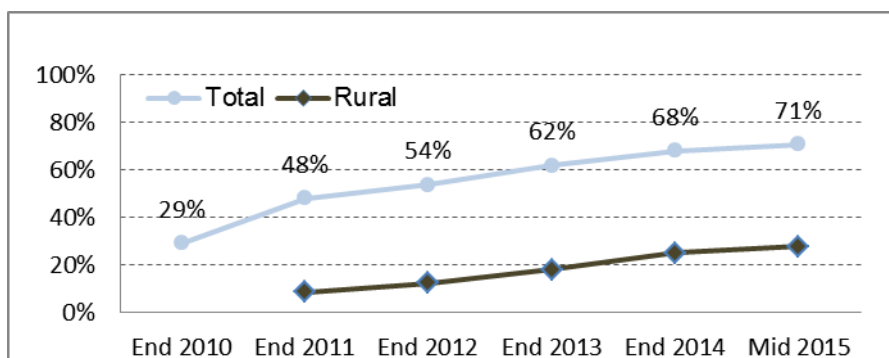
Vodafone tried a quicker and more efficient method in 2015, involving an exchange of assets with the cable operator Liberty Global at the European level, but the 2 groups couldn't agree on valuation, as Liberty Global had a strong fallback position with the possibility of merging with alternative mobile networks in each European country and therefore still benefiting from strong synergies. Vodafone has been left out in the cold, only able to compete in quad-play by re-selling the fibre of incumbent operators at low margins, without enjoying the benefit of any synergies. This situation alone highlights the vulnerability of a mobile-only operator.

## ■ Trends towards future market structures

### Fixed-line access

For fixed-line access a considerable amount of European fixed-line network upgrades have already taken place, since the new impulsion given by the EC, specifically the EC's non-discrimination and cost methodology recommendation in 2013, completed by the new European regulatory framework proposal, which explicitly redirects the objectives of regulation towards investments in "very high capacity" connectivity. This is however an on-going process, with an objective of 100% population connectivity offering a download speed of at least 100 Mbps across Europe to achieve in 2025, from 71% of population connectivity at 30 Mbps in mid-2015.

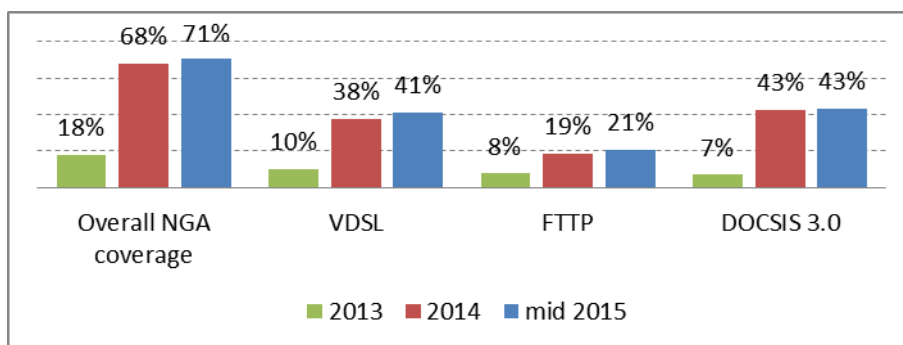
Figure 20 - Next generation access (NGA) broadband coverage in the EU



Source: IHS, VVA and Point Topic- in Europe's Digital Progress Report 2016 – Connectivity

Those deployments are by no means confined to the incumbents, with cable operators also extending their footprints with new coverage as well as an upgrade to Docsis 3.x and new entrants laying fibre of their own.



**Figure 21 - NGA broadband coverage in the EU by technology**

Source: IHS, VVA and Point Topic- in Europe's Digital Progress Report 2016 – Connectivity

In the future, the likely use of 5G as a fixed-radio access (FRA) technology should further enhance prospects for network-based competition.

As a result, on the fixed access side, technology driven evolution as well as successful regulatory willpower is leading to strengthened infrastructure-based competition, with at least 2 competing operators in each European country.

## Mobile

Due to (1) the current market structure of 3 to 4 mobile operators supplemented by MVNOs in each European country, (2) the ever-higher capital intensity required because of shortened technology cycles and exploding capacity needs from customer data consumption with associated spectrum fees, and (3) constrained revenue uplift resulting from competition, mobile operators are being squeezed as we have explained in previous sections of this document.

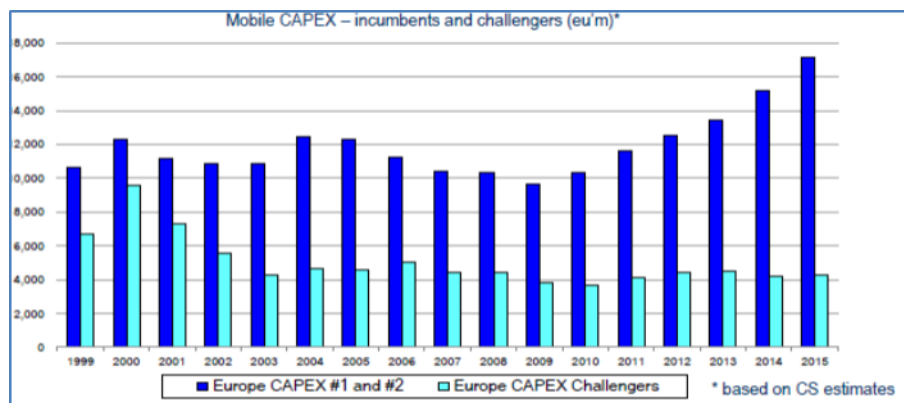
Approximately half of Europe is already a three-operator market or has seen some form of consolidation taking place. Merger control regulation is quite reluctant though and, when approved, in-market consolidation is assorted with strong remedies.

However, the strong rise in data consumption has hit the economical equilibrium of MVNOs, as their wholesale deals with operators are historically priced on a metered formula.

### The converged market from 4G to 5G

Considering the existing investment gap between the top 2 players of each European market and the other challengers (numbers 3 & 4) is another way of emphasizing that consolidation is inevitable with the new technology cycles (4G and anticipated 5G). In its June 2016 research "4G network wars", Credit Suisse shows that the gap between incumbents and challengers is widening with 4G.

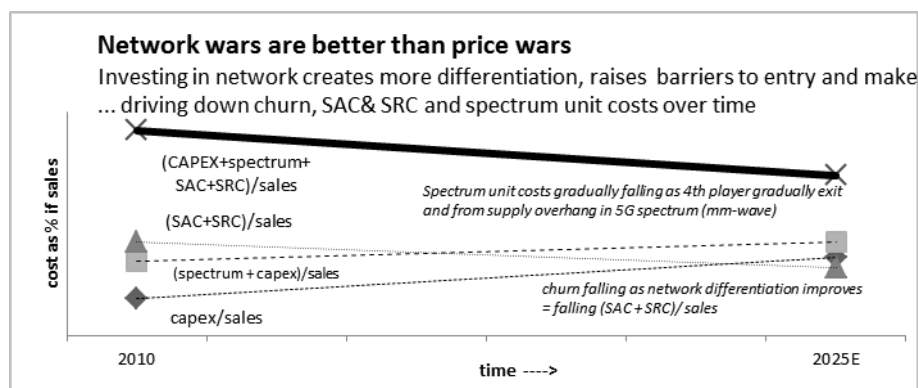
Figure 22 - CAPEX gap between incumbents and challengers



Source: Company data collected by Credit Suisse

Credit Suisse also points out in the same research, that the cost of staying in the game for mobile operators is rising, with 5G needing many more base stations to make mm-wave work (which is further driving the industry to scale). Consequently, using convergence to control costs, allows operators to generate enough margin to further invest and deploy new generation networks, creating a virtuous circle.

Figure 23 - Future trends for CAPEX &amp; OPEX thanks to convergence



Source: Credit Suisse research

## ■ Policy implication of convergence

As seen in the previous sections, fixed-mobile convergence generates efficiencies but may reduce competitive intensity in the mobile telecom market. This is notably true in the event of a duopoly of fixed operators, both integrated with a mobile operator, and competing on convergent fixed-mobile offers. Convergence may lead to a more concentrated market and also to lower churn rates, as mentioned before in this paper.

## Merger control tools unfit for regulation

The regulatory treatment of duopolies is a notorious challenge for public authorities. BEREC, the Body of European Regulation of Electronic Communications, indicated in its "High-level Opinion on the European Commission's proposals for a review of the electronic communications Framework" (BoR (16) 213) "that Regulators should have the ability to regulate so-called "non-competitive oligopolies" – free from any single or joint dominance - and suggests that such regulation may refer to the "SIEC (Significant Impediment of Effective Competition) Test" used by the Commission in the context of merger control.

However, by nature the "SIEC Test" is not appropriate as such to support the regulation of an oligopolistic market, because it compares two situations,

i.e. before and after a merger, and it is not designed to evaluate a competitive situation in absolute terms. Moreover, competition authorities can observe the situation before a merger and reasonably assess its sustainability whether or not the merger takes place. But regulatory authorities would have no robust tools to anticipate the outcome of imposing regulation on an oligopoly.

### **Economic and legal challenges of duopoly regulation**

There are also two further obstacles against blunt "non-competitive oligopoly" - or duopoly - regulation:

- While there is a vast literature dedicated to monopoly regulation (see Jullien *et al.* 2010 for an overview) there is no equivalent for duopoly regulation that can guarantee that such regulation would improve market outcome. On the contrary, existing literature questions the efficiency of traditional forms of access obligations when imposed on duopolies (see Marc BOURREAU *et al.*, 2011).
- From a legal point of view, the existing telecom regulation is meant to prevent *ex ante* behaviors which would qualify as anti-competitive. So, besides sector-specific regulatory procedures which are justified by the progressive transition from a monopoly to competition that the sector is experiencing, there should be no more regulatory pressure concerning competitive conditions imposed on the telecom sector than on any other sector of the economy. This is an essential principle of competition policy, as it drives efficient allocation of resources, as well as balanced transactions between different sectors of the economy. As most economic sectors in a modern economy are oligopolistic, regulating oligopolies would imply potentially regulating most of the economy.

### **Preventing concentration induced by convergence in case of joint dominance**

Things are different when both operators making up a duopoly in the fixed market are also mobile operators, and if their market positions on the fixed market, together with the efficiencies resulting from fixed-mobile integration, allow them to provide mobile services with a discount which cannot be matched by a pure mobile operator. This situation may lead to a *de facto* concentration of the mobile market.

In such a case, the regulator will face a delicate balance between the need to maintain incentives for convergent operators to efficiently integrate fixed and mobile activities and pass on these gains to consumers, and the requirement to maintain a competitive mobile market structure.

One essential element for the regulator will be to assess whether the competitiveness of the mobile offers of fixed operators parties of a duopoly derives from genuine efficiency gains, or from cross subsidies allowed by a jointly dominant position on the fixed market. Intervention appears appropriate in the latter case, but not necessarily in the former case.

Following competition law jurisprudence, joint dominance can only be identified if the 3 criteria of the Airtours case are fulfilled:

- Market transparency by which each party knows what the other does,
- Sustainable individual interest of each party to collude (e.g. to mirror price increase) rather than compete (e.g. attract customers by lowering prices)
- No reaction may be expected from customer or from potential competitors.

Whether or not these conditions are fulfilled will depend on each case. In the case of a fixed duopoly serving a fixed national broadband market, the fulfilment of the two first criteria is not unlikely, especially considering that the telecom regulatory context does not incentivize any of the two operators to gain a decisive competitive edge over the other.

Regarding the third criterion however:

- Customers would find it difficult to by-pass the fixed broadband offers of the duopoly, as internet access has become essential for every individual and business and as mobile cannot really replace fixed access.
- Potential entry depends on the possibility for potential competitors, and notably for pure Mobile Network Operators, to share the non-replicable part of fixed access infrastructures. If such an access is possible, either through "symmetric" asset regulation of physical infrastructures, or through appropriate commercial wholesale access proposed by one or both party of the duopoly, then the third Airtours criterion may not be fulfilled. In the absence of such a possibility, the third Airtours criterion may be fulfilled.

A regulator assessing a situation in which pure MNOs risk being driven out of the market by discounted mobile offers proposed by a duopoly of

fixed-mobile convergent operators, should consider two questions: whether these discounts exceed fixed-mobile synergies, and whether the 3 Airtours criteria of joint dominance are fulfilled on the fixed market. If the answers to the two questions are yes, then the regulator has a good motivation and solid grounds to intervene.

However, a better option is to prevent the occurrence of such a scenario. Regulators should help MNOs to become fixed infrastructure operators themselves, by encouraging co-investing agreements for long-term rights on fixed infrastructure, either through appropriate symmetric asset regulation of fixed infrastructure, or by using the threat of SMP regulation to encourage commercial wholesale access offers conducive to sustainable competition.

## ■ Conclusion

The telecom service landscape has recently moved to convergent offerings and a general trend towards quadruple play offers as a market standard can be seen across Europe; this is driven by a demand from end users, as well as technological evolutions.

A trigger for convergent offers to develop seems to lie in the intensity of infrastructure competition in the fixed market segment. Major European players are now positioned to offer quadruple-play offers. This is the case of most incumbent telcos in their home country. It is also the case for most cable-operators through mergers or strategic partnerships between cable and mobile operators.

Mobile-only customers represent 11% of the residential broadband mobile market in Europe and nearly 0% of the Business market. This is not enough to sustain the business case of mobile-only operators, when customers requiring both fixed and mobile migrate towards convergent offers. The sustainability of mobile-only operators will come into question if they remain unable to provide competitive quadruple-play offers.

Quadruple play strategies from duopolistic fixed network operators integrated with mobile operators may lead to a concentration of the mobile market. To preserve fair competition on the mobile market, regulatory authorities should intervene solely to prevent this concentration when induced by a convergence strategy in a case of joint dominance. Regulatory remedies should focus on waiving joint dominance on the basis of the

Airtours criteria by granting access to the non-replicable part of fixed access infrastructures.

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