

**BEREC REPORT ON IMPACT OF FIXED-MOBILE  
SUBSTITUTION IN MARKET DEFINITION**

**8 December 2011**

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## 1. EXECUTIVE SUMMARY

This report considers the impact of fixed-mobile substitution (FMS) in market definition (primarily focused on the retail markets) and the main concepts relevant for this assessment. The available data show that the signs of FMS are generally increasing – particularly for voice services. The picture of FMS across Europe is highly heterogeneous and the degree of FMS depends on country specific factors.

The majority of National Regulatory Authorities (NRAs) have considered whether fixed and mobile services belong to the same market, and one NRA (RTR - Austria) has included fixed and mobile services in the same market.

There are a number of reasons why the majority of NRAs do not include fixed and mobile services in the same retail market including:

- i. the existence of different characteristics between fixed and mobile offers (e.g. differences in price, bandwidth, mobility and usage limitations); and
- ii. the existence of different preferences and different usage patterns between fixed and mobile services users (e.g. some NRAs considered that fixed broadband consumers use the service more intensively and demand higher bandwidth than mobile broadband consumers).

The influence of FMS on wholesale markets critically depends on FMS at the retail level (i.e. it is a relevant factor to have FMS at the retail level to find it at a wholesale level).

Asymmetric substitution can be a relevant factor to consider in FMS mainly due to the mobility feature of the mobile services (the mobility feature means that end users may substitute from fixed services to mobile services but not the other way around). This report considers NRAs practices when dealing with asymmetric substitution. The conclusions and final result of the market analysis should not depend of the specific practices followed by NRAs regarding the consideration of asymmetric substitution in the market analysis.

We also explore the factors which NRAs might consider in an assessment of FMS and the relative importance which NRAs currently ascribe to each factor. NRAs currently consider a wide range of factors and information to perform the assessment of FMS. The relevant factors and information discussed in the report are diverse and complementary and might depend on the specific circumstances of each market.

Finally we consider the implications of FMS on the competition assessment for traditional fixed voice and broadband markets. The report considers the potential

competitive constraint exercised by mobile voice (and mobile broadband) on the fixed voice (and fixed broadband) markets and not vice versa.

If FMS is sufficient to define a single retail market for fixed and mobile services, then it is possible that competition between mobile and fixed networks will reduce the market power of the fixed incumbent operator at the retail level. However, this might depend on whether the fixed operators have a mobile operation and its position in the mobile market. A full assessment considering all relevant factors would be necessary to determine if the retail market including fixed and mobile services is effectively competitive.

Even if fixed and mobile services are not considered to be in the same market, FMS may have implications for traditional fixed retail market failures because the degree of competition/substitution may solve some of the traditional problems. This may be considered (i) when analysing the fulfilment of the three criteria test for imposing ex ante regulation, (ii) in the significant market power (SMP) analysis or (iii) when NRAs are evaluating the appropriate obligations to impose in the markets.

FMS is mainly a retail issue and is less likely to arise at a wholesale level. However, the existence of FMS at a retail level may influence the wholesale market through indirect competitive constraints, which could have an impact on the competition assessment in the wholesale market.

## 2. INTRODUCTION

A number of factors have made fixed-mobile convergence an increasingly prominent topic for electronic communication markets. For example:

- the development of new services available on fixed and mobile networks;
- new technologies improving the performance of mobile networks;
- new devices adapted to both fixed and mobile usages;
- new commercial offers and usage habits; and
- lower mobile termination rates.

ERG and BEREC analysed convergence in 2009<sup>1</sup> and 2010<sup>2</sup>, defining it generally as *“the technological improvements by which a number of networks arise with enhanced capabilities to provide multiple services”*. This implies, at the same time, that one service may be provided over a number of different networks.” Furthermore, *“Convergence at the network level can be understood as being able to offer a customer mobile and fixed (or fixed-like) services seamlessly by integrating fixed and mobile networks”*<sup>3</sup>.

Due to the above-mentioned transformations and technological improvements, convergence has led, in some cases, to increased FMS which led the regulators to question if fixed and mobile services should belong to the same relevant market. In some cases this has led to important shifts in the approach to regulating traditional fixed markets where market failures are observed.

This increase in FMS has occurred mainly in voice and broadband services and at the retail level. This report will therefore mainly focus on an analysis in these areas.

This report does not try to perform FMS analysis or reach any conclusion regarding including fixed and mobile services in the same relevant market, as it deems this to be the remit of NRAs at the national level.

Within the perspective of the next round of market analysis, this report gathers information from available studies on the subject matter and from the submission of 26 NRAs that responded to a questionnaire (*cf. Annex 3*).

On the back of available information this report aims to:

- provide guidance on the information that may be used by NRAs to analyse the possible integration of fixed and mobile services in the same market; and

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<sup>1</sup> ERG – March 2009 – Report on fixed-mobile convergence: implications on competition and regulatory aspects.

<sup>2</sup> BEREC – December 2010 – BEREC report on convergent services.

<sup>3</sup>This report does not aim to assess the impact of convergent products for the purpose of market definition.

- present a generic analysis on the potential impact of FMS on traditional fixed markets failures.

## 2.1. Structure of the report

The key concepts relevant for market definition and an analysis of FMS are covered in section 3.

Voice, data and, in some cases, TV were traditionally predominantly provided through fixed networks (DSL, cable...). Voice and data (and also, to some extent TV) also became accessible through mobile networks due to the development of 2G and 3G mobile networks. Over time voice and broadband services provided via mobile networks may have become more similar in terms of characteristics and functionalities to fixed services, which can lead to a higher degree<sup>4</sup> of substitution. Evidence of such FMS patterns is considered in section 4 of this document, based on available quantitative indicators.

Some NRAs have already analysed FMS (or non-substitution) while defining both retail and wholesale markets. Based on the answers collected from the questionnaire, a general snapshot of these initiatives is discussed in section 5. One of the most important examples of such a substitution analysis was performed by the Austrian regulator (RTR) who looked at broadband retail access for both residential and business users. The serious doubts expressed by the European Commission towards the retail market definition carried out by RTR (*cf. box hereafter*) highlight how complex such an analysis can be. Based on the information collected from NRAs through the questionnaire answers, section 6 of this report will provide guidance on the information that may be used by NRAs carrying out FMS analysis.

The potential impact of FMS on traditional fixed market failures will be discussed in the last section of this document.

### **Broadband retail access FMS – the Austrian case<sup>4</sup>**

In order to define the wholesale broadband access market within the third review of the market analysis, RTR started its analysis by examining the corresponding retail market. RTR differentiated between retail DSL products for business customers on the one hand, and retail DSL products for residential customers on the other hand. RTR then concluded that, for the residential retail market in Austria, cable was a sufficiently close substitute to DSL and mobile broadband connections were sufficiently close substitutes for DSL and cable connections to include all of them in the same retail market. As a

<sup>4</sup>AT-2009-0970.

consequence, due to (mainly infrastructure-based) competitive pressure exerted by cable network operators, mobile network operators and unbundling operators, RTR considered that a trend towards effective competition could be identified in the residential customers' retail broadband access market. These findings led RTR to the conclusion that only the wholesale broadband access market for bitstream connections for the subsequent use of business customers may warrant ex ante regulation.

After the notification by RTR of the market definition for wholesale broadband access in Austria, the European Commission expressed serious doubts as to the compatibility of the notified measure with Community law. The inclusion of mobile broadband access in the residential retail broadband access market was one of the points made by the Commission in its serious doubts letter.

In order to address the serious doubts raised by the Commission, RTR submitted additional information during the investigation period to its notified draft measure. The European Commission then, while stressing that fixed and mobile retail broadband services do not normally belong to the same relevant market, withdrew its serious doubts on the basis of circumstances closely related to the Austrian market. The residential broadband retail market in Austria thus includes both fixed and mobile services.

## **2.2. Scope of analysis**

As indicated above, analysis will be focused on two patterns of FMS:

- mobile voice services becoming substitutes for traditional fixed voice services;
- mobile broadband services becoming substitutes for traditional fixed broadband services.

Other patterns of FMS may occur or be envisaged but will not be specifically considered in this report<sup>5</sup>.

### **Distinction between mobile and fixed services**

The development of convergent devices, networks or services – analysed in the previous works of BEREC and IRG – tends to blur the boundary between fixed and mobile services. In “basic situations”, the distinction between fixed and mobile services is obvious:

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<sup>5</sup>One might for instance envisage that mobile TV services (3G or DVB-H) become substitutes to fixed TV services (through DSL or satellite or terrestrial TV). A DSL operator may also, through the sharing of its customers Wi-Fi connections, offer a broad data coverage (at least in urban area) that might be regarded as a substitute for mobile broadband (through 3G networks).

- voice and broadband services that use a copper, cable or optical fibre line are fixed services;
- voice services accessed through a mobile phone connected on a mobile network (2G, 3G...) constitute a mobile service;
- broadband services accessed through a mobile network (2G, 3G...) - for instance using a laptop and a 3G dongle –constitute a mobile service.

The distinction can become much more difficult for some other services where the differences between fixed and mobile services may be complex and subjective<sup>6</sup>. This report does not aim to precisely define what should be regarded as fixed and what should be regarded as mobile, which may depend on the national context.

### Retail and wholesale markets

As recognised by the Commission in its Recommendation on relevant product and service markets within the electronic communications sector susceptible to *ex ante* regulation<sup>7</sup> (*hereinafter, Recommendation on relevant markets*), the starting point for the identification of a market is the definition of retail markets from a forward-looking perspective, taking into account demand-side and supply-side substitutability. And, starting from the defined retail markets it is then appropriate to identify relevant wholesale markets.

Taking into consideration the importance and essential prerequisite of retail market substitution for the existence of substitution at the wholesale level, **within this report FMS will primarily be discussed at the retail level**. Wholesale markets will nonetheless be considered briefly mainly in section 7 of this report.

### Markets for residential customers and business customers

Residential and business customers may have significantly different needs and therefore the definition of two separate markets might, in some circumstances, be appropriate. These differences may consequently have an important impact on the result of a FMS analysis. For instance, in the Austrian case (*cf. above*) RTR concluded

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<sup>6</sup>Cases become, for instance, more complex when the nature (fixed or mobile) of the service is not obviously deduced from the device or the underlying platform. For example:

- a mobile phone voice service using a 3G femtocell (and thus a copper network after the femtocell) could be regarded as a fixed or mobile service depending on specific circumstances;
- a data service used through a laptop or a mobile phone connected to Wi-Fi hotspots created by some of the customers of a DSL operator (and accessible to the customers of this fixed operator) could be regarded as a fixed or mobile service depending on specific circumstances;
- a voice service accessed from a “fixed like” phone connected to the mobile network (and delivered independently of the fixed access network) through a home zone offer could be regarded as a fixed or mobile service depending on specific circumstances.

<sup>7</sup> Commission Recommendation of 17 December 2007 on relevant product and service markets within the electronic communications sector susceptible to *ex ante* regulation – hereinafter Commission Recommendation – in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services, OJ L344/65 of 28 December 2007.



that mobile broadband was a substitute for DSL broadband for residential customers, but not for business customers. At the same time, differing needs do not necessarily imply the existence of separate residential and business markets. A comprehensive assessment of demand-side substitution (including possible chains of substitution) and supply-side substitution would be necessary to identify whether a unified or segmented product market is appropriate in the particular national context.

The main purpose of this document is not to question the differences between residential and business customers. The specific analysis of the business segment was studied in other BEREC work<sup>8</sup>.

Rather, analysis will be focused on the residential segment. To some extent, the analysis may be transposed to the business segment, especially for small sized enterprises. However, the approach may also differ significantly for the business segment depending on national circumstances.

### 3. KEY CONCEPTS

The following section presents the main concepts used to assess product/service substitution within the economic market definition exercise. Later, the section presents the main issues relating to demand-side and supply-side substitutability, and discusses asymmetric and symmetric substitution. Examples from the electronic communications industry are used to provide guidance for NRAs.

#### 3.1. Market Definition

According to the Commission Recommendation *“the main purpose of market definition is to identify in a systematic way the competitive constraints that the undertakings face.”* Thus, *“market definition is not an end in itself, but a means to assessing effective competition for the purposes of ex-ante regulation.”*

Market definition is fundamentally about identifying the products/services which compete in the same market. It draws the boundaries around the products/services which exert price pressure on each other, and are considered closely substitutable for each other.

In defining the relevant market, NRAs have to take into account the degree of substitutability between services (demand-side and supply-side), potential indirect constraints (where sufficiently strong and immediate), potential chains of substitution,

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<sup>8</sup> BEREC report on the public consultation on relevant market definition for business services (February 2011) - BoR (10) 46.

as well as other characteristics such as the way of bundling of services, price discrimination, etc.

### **3.2. Substitution**

Substitution represents the essence of the criteria used in order to establish the adequate boundaries of the market at stake. It refers to the products which are regarded by the end consumers as interchangeable, the main point being that one product exerts competitive pressure on another (or several others). If this is the case, the relevant market should cover all the substitutable products or services.

Substitution can take place both from the demand-side and the supply-side. In both demand and supply side substitution it is important to consider the current sources of competition in the market and also the potential sources of competition that may affect the market in a near future (potential substitution), to the extent that they may be sufficiently immediate to act as a pricing discipline on the relevant focal products. Where such potential substitution is not sufficiently immediate to be included within the relevant market boundaries, it may be more appropriately assessed in any subsequent SMP analysis.

Product A is considered a substitute for product B if demand for product A increases in response to an increase in the price of B (all other things equal) – in this case the two goods exhibit positive cross price elasticity of demand.

On the other hand, two products are complements if an increase in the price of one leads to a fall in demand for the other (all other things equal), implying a negative cross elasticity of demand.

#### **Useful information in identifying demand-side and supply-side substitutes**

An analysis of the product characteristics and its intended use allows us, as a first step, to limit the field of investigation of possible substitutes. However, product characteristics and intended use are insufficient alone to show whether two products are effective demand substitutes. Functional interchangeability or similarity in characteristics may not, in themselves, provide sufficient criteria because the responsiveness of customers to relative price changes may be determined by other considerations as well. Conversely, differences in product characteristics are not in themselves sufficient to exclude demand-side substitutability, since this will depend to a large extent on how customers value different characteristics.

This suggests that evidence on substitution from a number of different sources should be considered. Although the information used will vary from case to case, there are some pieces of evidence and issues often likely to be important<sup>9</sup>.

### **How much substitution is enough?**

There is no clear procedure within competition law for determining when the degree of substitution is enough to justify a revision of the definition of a relevant market. In economic analysis, the small but significant and non-transitory increase in the price test (*hereinafter SSNIP or hypothetical monopolist test – discussed further below*) and the critical loss test<sup>10</sup> or the critical elasticity of demand are used.

Substitute products included in the same market can have quite different technical characteristics but still be considered in some instances to fulfil similar functions from the point of view of end users (for example, different products could be in the same market because according to national circumstances a segment of customers may view them as close substitutes for certain purposes – Austrian case: fixed and mobile broadband internet for residential customers). Similarly, the products' prices do not have to be identical. For example, if one product is of lower quality, customers might still switch to it if the price of the higher quality one increased such that they no longer felt that the higher quality justified the price differential.

What is most important is the degree of competitive pressure (price limitation) that one product exerts on another.

In practice, the concepts of demand-side and supply-side substitutability are typically applied in the framework of the SSNIP test, where interchangeability is assessed based on non-transitory changes in relative prices. In the Commission's Notice on relevant markets, the SSNIP test is described as "a thought experiment, postulating a hypothetical, small, non-transitory change in relative prices and evaluating the likely reactions of customers to that increase".

The SSNIP test attempts to describe customers' reaction to a hypothetical small (5-10 per cent) but non-transitory relative price increase on the products and in the areas being studied. If substitution were enough to make the price increase unprofitable on the grounds of reduced sales, additional products and areas would be included in the relevant market until the product market and geographical market were such that a small, permanent increase in relative prices would be profitable. The SSNIP test shows

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<sup>9</sup> For further information see "COMMISSION NOTICE on the definition of relevant market for the purposes of Community competition law".

<sup>10</sup> The critical loss is defined as the maximum sales loss that could be sustained as a result of the price increase without making the price increase unprofitable.

that the own-price elasticity of demand is normally decisive to conclude on the market definition. The cross-price elasticities indicate the next best substitutes (i.e., the products or services which should be included in the market in the next step if the own price elasticity is large enough/larger than the critical elasticity).

Since an exact implementation of the SSNIP test based on revealed or stated consumer preferences is usually difficult in practice (or at least based on a number of assumptions), a number of other criteria such as product characteristics, (relative) price changes and their effect on quantities, use, consumer perception and past substitution should also be looked at.

### **Symmetric substitution vs. asymmetric substitution**

In case of symmetric substitution, if product A is a substitute for product B, then product B is necessarily a substitute for product A, and an equally strong substitute. In other words, an increase in the price of product A will cause demand for product B to increase and vice versa.

However, substitution possibilities are not necessarily symmetric. Asymmetric<sup>11</sup> substitution describes the situation when substitution between two products only occurs in one direction.

#### **Example of asymmetric substitution**

Users of narrowband services may switch to broadband services in response to an increase in the price of narrowband services, but the opposite may not be the case (e.g. because today's applications used by end users require more and more capacity).

Markets can be asymmetric for a number of reasons, such as consumer preferences, the introduction of new technologies, the potential for price discrimination and the position of the product in question in the supply chain (i.e. whether it is an input or a final product sold to consumers).

In an asymmetric substitution situation it is important to define the focal product of the market analysis. The focal product is defined as **the main product under**

<sup>11</sup> An example of asymmetric market definition where both analysed products/services were identified as belonging to the same market, can be found in European Commission decision of July 12th 2000 in Case COMP/M.2547- Bayer / Aventis Crop Science which involved agricultural crop-protection products. EC found evidence of substitution from foliar and soil applications of fungicides and insecticides to seed treatment, but not the other way around (from seed treatment to the other applications).

*"(809) Moreover, the investigation shows that there is substitution from foliar and soil applications into seed treatment, whenever this is possible, but not the other way around. The investigation does not lend support to the parties' argument that farmers would switch back to fungicides or insecticides applied to the plant after sowing, instead of sowing pre-treated seeds in face of a price increase. As discussed above, seed treatment will be further endorsed in the EEA because of a better environmental fit compared to traditional applications of insecticides and fungicides, its better safety to the user and easier application."*

**investigation** and the focal area is the area under investigation, in which the focal product is sold. The definition of the focal product may depend on specific market conditions and on the issues that NRAs want to address during the market analysis.

When analysing FMS in an asymmetric substitution situation, an NRA **should start by identifying the focal product** considering their national market conditions. One of the possible criteria chosen by NRAs might be to define the focal product as the one where competition problems are believed to exist. The experience in the European Union and the analysis of the European Commission<sup>12</sup> has been that market failures are more likely to arise in the markets for fixed services (e.g. retail fixed access, retail broadband access when analysing markets 4 and 5) than in mobile services.

Two ways of considering asymmetric substitution in market analysis have been identified:

- (a) Consider the effects of asymmetric substitution on the focal product while performing the market definition (Practice A);
- (b) Consider the relevant effects of asymmetric substitution on the focal product (i) when analysing whether the three criteria test<sup>13</sup> for imposing ex ante regulation is met; (ii) in the competition assessment or (iii) when defining the appropriate obligations to impose in the market (PRACTICE B).

Whether the competitive constraints of asymmetric substitution are considered in the market definition phase or in other phases of the market analysis should not affect the final result.

### **Practice A**

After the identification of the focal product, the NRA verifies that there is substitution from the focal product to the alternative product(s) but that there is not substitution from the alternative product(s) to the focal product. In this case the alternative product(s) are included in the same market as the focal product.

#### **Practice A – inclusion in the same market**

In September 2009 ANACOM published the review of the retail and wholesale leased lines markets. Asymmetrical substitution was identified in this case because the SSNIP test revealed that operators would change from “traditional” leased lines to Ethernet leased lines but not the other way around. Considering that traditional leased lines (i)

<sup>12</sup> EXPLANATORY NOTE to the Commission Recommendation on Relevant Product and Service Markets

<sup>13</sup> The three cumulative criteria for ex ante regulation are: (i) significant and non-transitory barriers to market entry, (ii) the market exhibit characteristics such that it will not tend towards effective competition over time and (iii) ex post application of competition law by itself is insufficient to regulate the market

was the only product considered in the previous market analysis; (ii) was the product in which obligations were imposed and (iii) was the product with the higher volume of leased lines installed, ANACOM defined this product as the focal product. In consequence, verifying that traditional leased lines were substituted by Ethernet leased lines, ANACOM concluded that both products should be included in the same market.

On the other hand, if there is no substitution from the focal product to the alternative product(s) – and only substitution from the alternative product(s) to the focal product – the alternative product(s) should not be included in the market.

#### **Practice A – non inclusion in the same market**

In the Commission decision of 16 July 2003 (Case COMP/38.233 – Wanadoo Interactive) the product under investigation (the focal product) was **high-speed internet access** and, even though the Commission admits that low-speed and high-speed internet access present some degree of substitutability, it concludes that the substitutability is extremely asymmetrical i.e. the migrations of customers from offers of high-speed to low-speed access are negligible compared with migrations in the reverse direction. Consequently, the Commission “*considers that the relevant service market to be used in analysing Wanadoo Interactive's conduct is the market for high-speed internet access for residential customers*”.

#### **Practice B**

In this case the NRA does not include the focal product and the alternative product(s) in the same market regardless of the direction(s) of the substitution between the products. The NRA considers that the alternative product(s) belong to a distinct adjacent product market exercising competitive constraints on the focal product market. In this case NRAs take into account the competitive constraints (if they exist) caused by the alternative product(s) when analysing whether the three criteria test for imposing ex ante regulation is met. It would also be possible to consider the effects of asymmetric substitution during the competition assessment and when defining the appropriate obligations to impose in the market.

#### **Practice B – asymmetric substitution prevents inclusion of focal and alternative products in the same market**

In Finland, “*FICORA assessed, separately for the residential and for the business segment, the substitution between fixed access and mobile access for voice services. In summary, the regulator found that retail fixed access for voice services was fully substitutable with mobile access services, but not the other way around. That is, there*

*was no two-way substitution between these services. If there was a SSNIP of retail fixed access services, fixed subscribers would switch to mobile telephony subscriptions. But, if there was a SSNIP of retail mobile access services, mobile subscribers would not switch to fixed telephony subscriptions. In this case FICORA considered that the non symmetric substitution lead to the definition of two separate markets: **retail mobile access is a distinct adjacent product market which gives rise to competitive constraints being exercised on operators in the fixed access market**".*

*Afterwards FICORA verified that the fixed access market did not meet three cumulative criteria for ex ante regulation. In consequence FICORA proposed to withdraw the existing SMP designations in the related fixed markets.*

In general, the information relevant to an asymmetric substitution analysis is the same as in a symmetric substitution analysis. However, in the asymmetric substitution cases it may be more important for NRAs to collect information that can explain the reason behind the existence of asymmetric substitution (why end users change from A to B and don't change from B to A?). For instance, while considering asymmetric substitution between fixed and mobile services it can be relevant to analyses in detail if mobile users value the mobility feature such that they would be unwilling to switch to fixed services.

#### 4. EXISTENCE OF FMS

To get a first overview of possible FMS trends in Europe, a preliminary quantitative analysis was carried out based on available data. Data published by the European Commission through the Implementation reports, the Digital Agenda Scoreboard<sup>14,15</sup> and the E-communication Household Survey<sup>16</sup> provides indicators that are relevant for a preliminary analysis of FMS.

However, the level of FMS and its impact on market analysis requires a deep understanding of local characteristics in each country. Trends that may be extracted from generic information should thus be handled carefully and essentially regarded as illustrative only. A case by case analysis, carried out for each dedicated national market, is necessary to assess precisely the level of FMS.

<sup>14</sup>[http://ec.europa.eu/information\\_society/digital-agenda/scoreboard/index\\_en.htm](http://ec.europa.eu/information_society/digital-agenda/scoreboard/index_en.htm)

<sup>15</sup>[http://ec.europa.eu/information\\_society/digital-agenda/scoreboard/docs/pillar/electronic\\_communications.pdf](http://ec.europa.eu/information_society/digital-agenda/scoreboard/docs/pillar/electronic_communications.pdf)

<sup>16</sup>[http://ec.europa.eu/information\\_society/digital-agenda/scoreboard/docs/pillar/studies/eb\\_ecomm/final\\_reports/reporte751sp362infoecommunications\\_en\\_final.pdf](http://ec.europa.eu/information_society/digital-agenda/scoreboard/docs/pillar/studies/eb_ecomm/final_reports/reporte751sp362infoecommunications_en_final.pdf)

Available information essentially focuses on voice and broadband residential retail markets. Consequently, preliminary analysis carried out in this section only focuses on residential retail markets. These trends may thus not be the same for businesses retail markets.

Although the development of bundled offers tends to blur the boundaries between voice and broadband retail markets, the existence of FMS will be looked at considering voice services and broadband services separately.

#### **4.1. FMS trends – Voice services**

##### **4.1.1. General snapshot**

At the EU 27 level, as pointed out in the 15<sup>th</sup> Implementation report, fixed voice telephony is declining both in terms of revenues and volumes. Traditional fixed voice telephony services are increasingly being replaced by Voice over Broadband services and also by mobile solutions.

FMS for voice services can be considered in terms of calls and access.

##### **Calls**

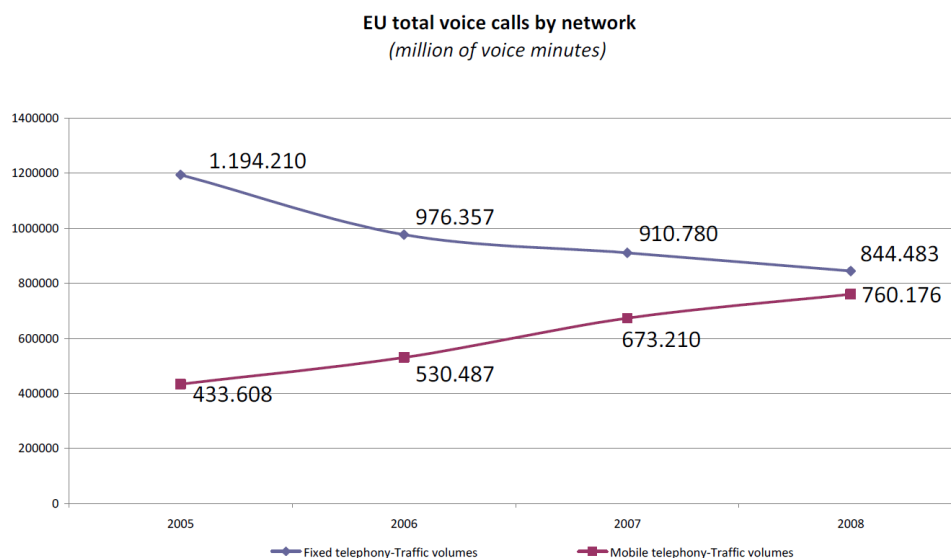
The total number of voice calls (in minutes) initiated from fixed accesses decreased from 2005 to 2008, while it increased from mobile accesses. This could demonstrate, at a European level, a certain trend of FMS over time, regarding calls. However, as can be seen from the graph below, the rate of decline in fixed voice traffic and corresponding increase in the share of mobile voice traffic in relation to total traffic notably slowed between 2008 and 2009<sup>17</sup> suggesting a possible levelling off in this trend. Because many other factors are involved in the increase/decrease of fixed or mobile voice traffic<sup>18</sup>, this basic analysis is not sufficient to reach a conclusion. An analysis based on detailed national data is necessary to reach a conclusion.

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<sup>17</sup>In 2009, the Mobile traffic share (51.6%) exceeds for the first time the fixed traffic share (48.4%) – Source: Digital Agenda Scoreboard 2011.

<sup>18</sup> Remark – Other parameters may explain the decrease in the total number of voice calls initiated from fixed access. For instance, part of the voice traffic initiated from fixed access is not counted as such Skype.



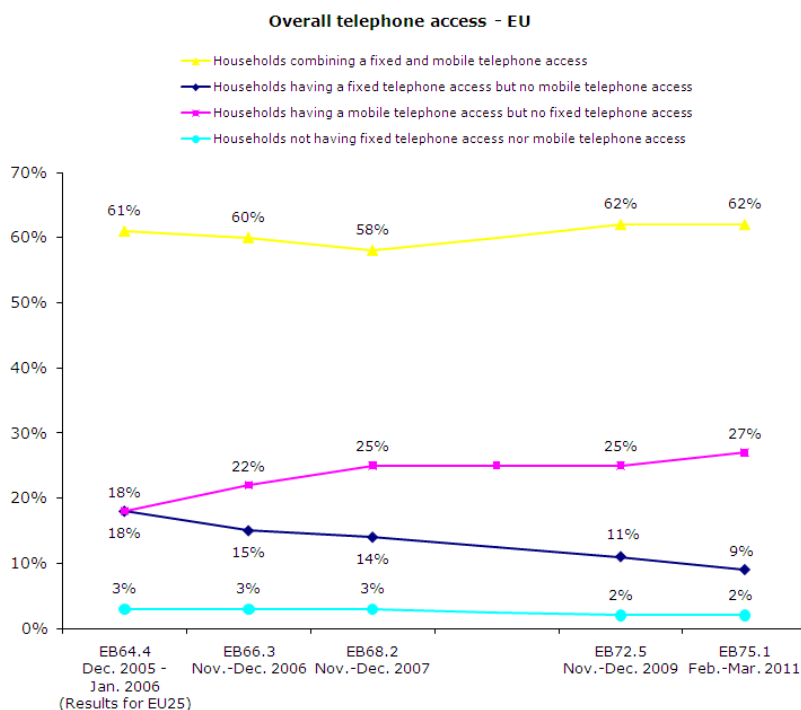


Source: European Commission

**PROGRESS REPORT ON THE SINGLE EUROPEAN ELECTRONIC COMMUNICATIONS MARKET**  
(15<sup>th</sup> REPORT)

### Voice access

The general picture drawn from the E-communication household survey figures shows that although the share of mobile only households increased and fixed-only households decreased, dual access (both fixed and mobile telephone access) is still the most common situation (62% of households) and is not declining.



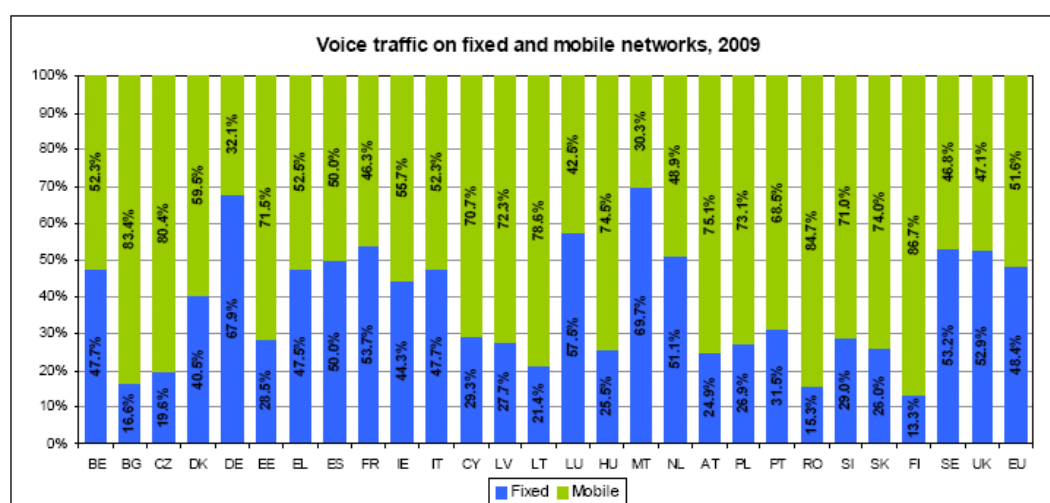
Source: E-communications household survey (July 2011)

Based on these general figures, one may conclude that fixed and mobile access are generally regarded as complementary (and not as substitutes). Once again, other factors nonetheless need to be considered and an analysis based on detailed national data would generally be necessary to reach a conclusion.

#### 4.1.2.A highly heterogeneous picture

Looking at each country separately, the general picture is highly heterogeneous.

#### Calls



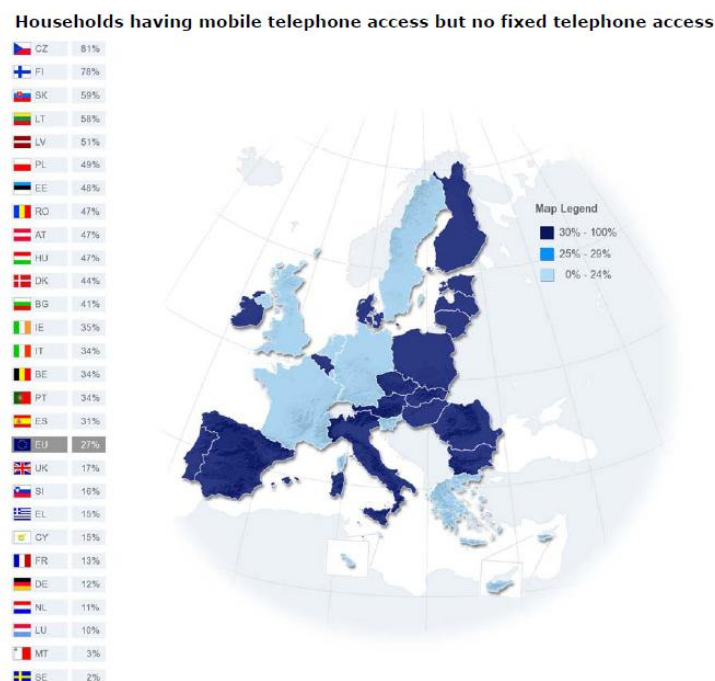
Source: European Commission  
ELECTRONIC COMMUNICATIONS MARKET INDICATORS - Digital Agenda Scoreboard 2011

The above graphic illustrates that, in countries such as Austria, Bulgaria, the Czech Republic, Lithuania, Romania and Finland, more than 75% of the outgoing voice traffic is originated from mobile networks. For these countries, where fixed network coverage and penetration was previously high, it is possible that calls that “historically” originated from fixed networks are now originated from mobile networks. However, it may also be the case that in countries where mobile networks were rolled out in the absence of full fixed coverage and penetration, mobile voice traffic represents a new source of market demand (e.g. for those who did not previously have fixed voice access). The expansion of mobile minutes would thus not necessarily derive from FMS but rather, in some cases, from mobile networks addressing an untapped or unavailable part of the market.

#### Voice access

Based on the 2011 E-communication household survey, the number of households having at least one mobile telephone access is rather high and homogeneous – from 82% to 96% (average 89%) – across Europe. On the other hand, fixed line penetration

is extremely heterogeneous: fixed access is very high in countries such as Sweden<sup>19</sup>, the Netherlands (89%) and France (87%) whereas no more than 17% of the Czech households are connected. This heterogeneity is also striking looking at mobile only households (from 2% to 81% - *cf. graph hereafter*) and dual access (from 15% to 94%).



Source - E-communication household survey (2011)

Based on this observation, the substitution of fixed-voice by mobile voice services should be assessed on a case by case basis.

Without entering into a detailed case by case study two extreme patterns can be identified:

- a- Countries with low and decreasing fixed line penetration, offset by an increasing number of mobile only households (Czech Republic, Finland...*cf. Annex 1*).
- b- Countries with high and steady (or growing) fixed line penetration, and a large majority of dual access households (France, The Netherlands...*cf. Annex 1*).

Based on the raw figures shown in *Annex 1* (and without prejudice to the necessary country specific analysis), a trend toward increasing fixed to mobile voice access substitution may be expected for 'pattern a countries' other things being equal (*Annex 2 however provides an overview of other possible factors that might influence this trend*), whereas fixed and mobile access seem to be complementary (and not substitutes) in

<sup>19</sup> Remark: E-communication household survey shows that the percentage of households having fixed telephone access in Sweden is 98%. This figure is not consistent with the evaluation made by PTS in 2010 (82%). This difference may be partially explained by different methodologies. Data collected by E-communication household Survey for Sweden should nonetheless be regarded as uncertain.

'pattern *b* countries'. Once again, other factors nonetheless need to be considered and data based on a national survey would generally be necessary to reach a conclusion.

FMS can also be observed when looking at reasons why households don't have fixed telephone lines at home. This indicator, from the 2010 E-communication households survey shows that the first reason is "*One or more household members has / have a mobile phone that serves the needs of the household*" (39%). Unsurprisingly, this reason is especially mentioned in countries such as the Czech Republic (60%; +5%<sup>20</sup>) or Finland (74%; +21%). It may also be important in countries such as Sweden (57%; +42%) where fixed line penetration is still high and steady, showing that substitution between fixed and mobile access may still be relevant for some of the inhabitants of a country where substantial FMS is not observed.

*A first analysis of the parameters that may influence the trend toward FMS, based on available data, is developed in Annex 2.*

## 4.2. FMS trends – Data services

### 4.2.1. General snapshot

Voice services are already almost universal throughout Europe. Conversely, data services are relatively new and the market is not as mature.

Overall internet access is increasing<sup>21</sup>, fixed broadband penetration is increasing<sup>22</sup>, mobile broadband penetration dedicated to data services is increasing<sup>23</sup> and the percentage of the population accessing the internet via a UMTS mobile phone is also increasing significantly<sup>24</sup>.

On top of that, data traffic is also growing significantly, both on fixed and mobile networks<sup>25</sup>.

Because both fixed and mobile markets are growing, looking for indexes of FMS at the European level is complex. However at the very least, it can be seen that the penetration and development of mobile broadband is growing faster than the penetration and development of fixed broadband. In addition, the Digital Agenda

<sup>20</sup> This figure refers to the percentage points variation from Q4 2009 to Q1 2011.

<sup>21</sup> Overall internet access increased by 5 percentage points between Q4 2009 and Q1 2011 (reaching 62% in Q1 2011) - Europe (2011 E-communication households survey)

<sup>22</sup> Digital agenda scoreboard (EU27): fixed broadband penetration was 20.2 lines out of 100 in 2007 and 26.6 lines out of 100 in 2010.

<sup>23</sup> Digital agenda scoreboard (EU27): mobile broadband penetration (dedicated data services cards/modem/keys only) was 2.8 lines out of 100 in 2008 and 7.2 lines out of 100 in 2010.

<sup>24</sup> Digital agenda scoreboard (EU27): 2.8% of the population accessed the internet via a 3G mobile phone in 2008 – 7.4% in 2010.

<sup>25</sup> Cisco visual networking index (February 2011): Global mobile data traffic grew 2.6-fold in 2010, nearly tripling for the third year in a row.

Scoreboard 2011 report showed that growth in fixed broadband access in 2010 was the lowest since 2003.

In Q4 2009, the E-communication household survey indicated that 4% of households with Internet access only use mobile networks to access the Internet<sup>26</sup>. The majority (85%) of those using just the mobile network to gain access to the Internet feel that this meets the needs of everyone in the household. For these households, which according to the E-communication household survey still represent a relatively narrow segment, mobile Internet access can potentially be regarded as a substitute for fixed line Internet access.

However, as discussed earlier, it may also be the case that some of these mobile-only households represent a new source of market demand for which mobile internet suits a particular need.

#### 4.2.2. Local differences

##### Broadband access

As for voice, the trend for FMS of data services may differ significantly depending on the country considered. Without prejudice to a particular country case analysis, these local differences can be caused by:

- Different levels of mobile broadband adoption;
- Different percentage of mobile data-only households among households connected to the Internet.

Use of the mobile phone network (via an Internet card or USB modem that is plugged into the computer or a computer connected to the Internet via a mobile phone or directly via the mobile phone itself) to connect to the Internet at home has shown an increase since winter 2009 (+3 percentage points)<sup>27</sup>. This type of access is most common in Finland, where around three in ten access the Internet this way (29%). Conversely, in Belgium (3%), France (3%), Luxembourg (3%) and Malta (3%) use is comparatively low (*cf. Annex 1*).

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<sup>26</sup> E-communication household survey (2010) – “Most households (six out of ten) are connecting to the mobile network via an Internet card or USB modem that is plugged into the computer. A third is connecting through a mobile phone and only one in seven are using a computer connected to the Internet via a mobile phone.”

<sup>27</sup> Source – E-communication household survey (2011).

Remark: “the survey tackles two different issues regarding mobile Internet connections. On the one hand the results presented in this chapter on the usage of the mobile phone network to connect to the internet at home and on the other hand the mobile subscriptions allowing connecting to the Internet. It is not because people have a mobile phone allowing them to surf on the Internet that they mainly use this device to connect to the Internet when they are at home.”

As indicated before, mobile data only households are not very numerous (average – 4%<sup>28</sup>). However, this rate was already close or even higher than 10% in Q4 2009 in a few countries such as Finland (9%), Ireland (11%), Austria (12%), Portugal (11%) and Slovakia (14%).

These few general figures point out that there might be signs of FMS of data services in countries such as Austria or Finland. However, other factors (such as those discussed in section 6 of the report) also need to be considered to reach a conclusion. This first snapshot also shows that the FMS may be localised among specific groups within a single country.

### **Broadband usage**

For data services it is possible to analyse fixed and mobile service usage by examining the average traffic (in GB per access) in fixed networks and mobile networks. However, it is difficult to get a clear picture of this because the average broadband traffic per access is usually not monitored, especially in fixed networks.

Before comparing broadband traffic per mobile and fixed access, two types of mobile access should be separated: mobile traffic exchanged from all devices and mobile traffic exchanged from dedicated data cards. Connections via data cards may potentially be regarded as substitutes for fixed line broadband, but smartphone connections seem to address much more specific needs. In terms of average traffic per access, it seems that traffic generated through dongles/datacards is much higher than traffic generated by smartphones<sup>29</sup>. Thus, the comparison between fixed and mobile broadband traffic is likely to provide very different results depending on the mobile devices that are considered (all devices, dongles/data cards only, smartphones only, tablets...).

In Germany, BNetzA estimated that broadband traffic was 3.2 GB per mobile access (all devices) and 125 GB per fixed access in 2010. In Portugal, ANACOM estimated that the average broadband traffic generated by a 3G dongle/datacard is 2.2 GB whereas it would be 27.3 GB for fixed access (monthly average in Q2 2011). These few figures collected through a questionnaire are too isolated to suggest a precise analysis. Nonetheless, they tend to show that usage is sometimes lower on mobile broadband

<sup>28</sup> Source – E-communication household survey (2010). Most households (six out of ten) are connecting to the mobile network via an Internet card or USB modem that is plugged into the computer. A third is connecting through a mobile phone and only one in seven are using a computer connected to the Internet via a mobile phone.

<sup>29</sup> In Italy for instance, AGCOM reports that the average traffic in Q1 2011 is 2,39 GB a mobile access (including dongles/datacards), whereas would be 6,59 GB for a 3G dongle/datacard. There is a similar situation in the UK. In the Mobile Call Termination Statement (March 2011) the modeling assumptions were 38 MB of traffic per month for a 3G handset in 2010/11 and 1050 MB of traffic per month for a dongle.

access than on fixed broadband access. If mobile and fixed broadband access were close substitutes, they would be expected to show similar traffic patterns.

*A first analysis of the parameters that may influence the trend toward FMS, based on the available data, is developed in Annex 2.*

## 5. FMS & MARKET DEFINITION BY NRAs

### 5.1. Practice and conclusions

The previous section noted that there are indications of FMS in some services for some European countries. The existence of FMS leads us to question if fixed and mobile services might “belong” to the same market. This section looks at how NRAs have analysed the possibility of fixed and mobile services belonging to the same market. It also aims to identify the sources used to gather the necessary information to perform the substitution analysis.

As mentioned in the introduction, BEREC circulated a questionnaire to NRAs to gather information on the issue of FMS in market definition. The evidence and conclusions presented in this section are based on the responses to this questionnaire<sup>30</sup>.

The majority of the NRAs have already assessed whether a particular fixed and mobile service was in the same market for voice and/or broadband. 88% of the NRAs that perform market analysis have already analysed the possible integration of mobile and fixed services in the same market at least once (either in retail or wholesale markets)<sup>31</sup>.

NRAs have analysed the possible integration of fixed and mobile services **both in retail and wholesale markets**. The results of the questionnaire showed that 21 of the 22 NRAs who analysed whether fixed and mobile are in the same market have done so in retail markets, while 17 of the 22 NRAs did so in wholesale markets. Some of the NRAs noted that the wholesale market analysis was a consequence of the existence of FMS at the retail level constraining the wholesale level, rather than as a consequence of direct substitution at the wholesale level<sup>32</sup>.

The results show that NRAs questioned the possible integration of fixed and mobile services, both at the retail and wholesale level, in the following areas: access to telephone networks, voice<sup>33</sup> and internet access related services<sup>33</sup>.

<sup>30</sup>Namely on sections 1 (questions 1 to 5), 2 and 3 of the questionnaire.

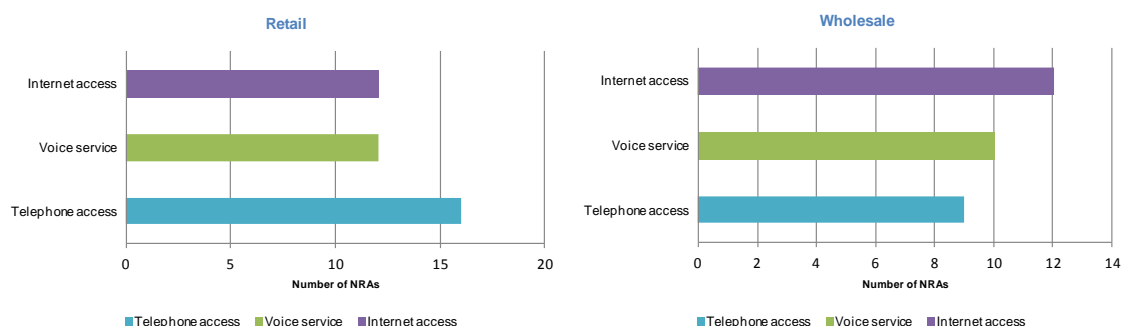
<sup>31</sup> As mentioned in the Introduction 26 NRAs answered to the questionnaire.

<sup>32</sup>BEREC has already dealt with this issue in its Report on self-supply – BoR (10) 09: “A company providing inputs at the wholesale level may be constrained “directly” at that level by other companies that are operating at the same level. Alternatively, that company may be indirectly constrained by the “customers of their competitors” i.e. that company may be indirectly constrained by competition that exists on the retail level”.

<sup>33</sup> The answers received were grouped considering the services.



**Figure 1. In which markets did you analyse the possible integration of mobile and fixed services in the same market?**



Although NRAs frequently question fixed-mobile service integration, it is quite rare that they conclude that fixed and mobile services are in the same market: Only RTR (Austria) has defined two retail markets integrating fixed and mobile services (national calls for residential users<sup>34</sup> and broadband access for residential users).

According to RTR, the main reasons for the integration of fixed and mobile services were the high demand elasticities of the fixed services and the movements of prices and quantities observed in the markets for the services considered.

The main reasons indicated by NRAs for the non integration of fixed and mobile services in the same **retail** market are as follows:

- the existence of different characteristics between fixed and mobile offers;
- the existence of different prices between fixed and mobile offers;
- fixed offers do not allow mobility in the use of the services;
- the existence of different preferences and different usage patterns between fixed and mobile services users; and
- fixed and mobile services are mainly complements rather than substitutes<sup>35</sup>.

The main reasons not to integrate fixed and mobile services in the same **wholesale** market are as follows:

- the different characteristics of fixed and mobile retail offers;
- the insufficient indirect competitive constraints existent at the wholesale level caused by the retail substitution; and
- the inexistence of direct substitution at the wholesale level.

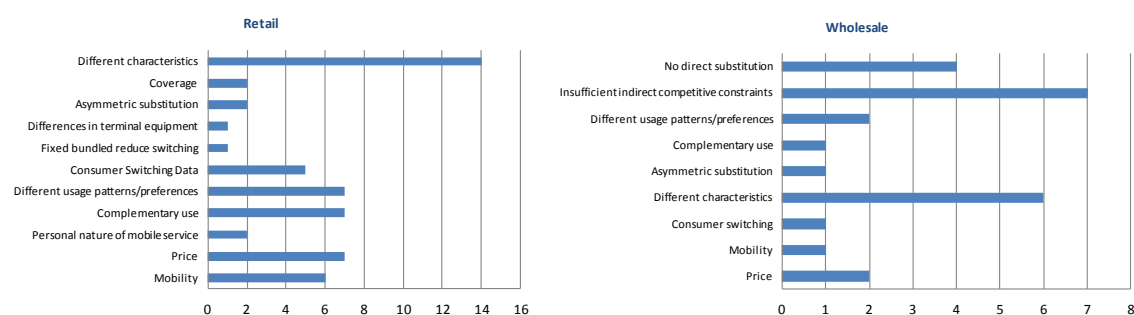
<sup>34</sup>AT-2009-0881.

<sup>35</sup> NRAs also mention other reasons for insufficient substitution between fixed and mobile services: different coverage of fixed and mobile services, market structure that supports complementary offers and not substitutive offers, existence of asymmetric substitution and not symmetric substitution (user change from fixed to mobile but not from mobile to fixed), the existence of low switching data or intention to switch between fixed and mobile services, etc.



It is possible to conclude that the main reasons for the non integration of fixed and mobile services in the same markets are mostly related to factors in the retail market, namely the different characteristics of fixed and mobile offers, the different usage patterns for the fixed and mobile services and, regarding the wholesale market, the insufficient indirect constraints between fixed and mobile services.

**Figure 2. What were the main reasons considered in order to conclude for the non substitutability in the markets?**



5 NRAs mentioned that even where they concluded that fixed and mobile services did not belong to the same market, there were situations in which the existence of FMS influenced their conclusions regarding SMP analysis or the imposition of obligations in the markets. So, the existence of FMS may affect not only the market definition but also other phases of the market analysis. We consider this briefly in section 7.

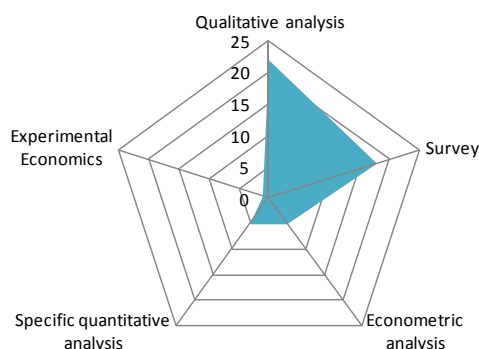
## 5.2. Type of analysis and information sources

The questionnaire revealed that NRAs tend to use a qualitative approach when performing FMS analysis<sup>36</sup>. Most NRAs have also relied on the results of surveys regarding the relevant markets and services. The use of econometric analysis and specific quantitative analysis<sup>37</sup> is much less common. Only one NRA reported to use an analysis based on experimental economics.

<sup>36</sup> In this qualitative analysis NRAs may use quantitative information available. For instance, when realizing the SSNIP test NRAs may consider quantitative information (e.g. prices of the different offers and the evolution in the number of accesses) while performing a qualitative analysis about how would consumers react to a 10% increase in the price of a specific offer without reaching quantitative conclusions regarding the elasticities of demand or the critical elasticity for the offers.

<sup>37</sup> As mentioned before the reference to qualitative analysis includes the use of quantitative analysis.

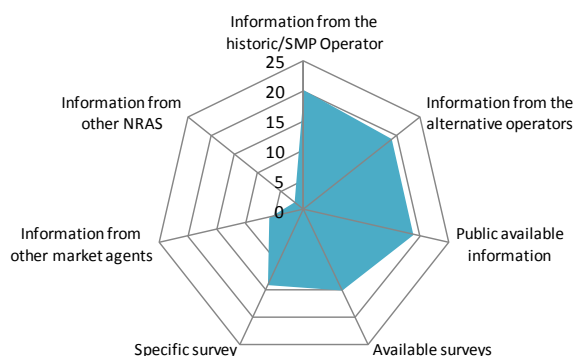
**Figure 3. What type of analysis did you perform when analysing the possible integration of fixed and mobile services under the same wholesale/retail market?**



When performing this kind of analysis, the most common information source is operators that are active in the markets. 91% of the NRAs performing FMS analysis collected the information from the SMP/historic operator and 86% of the NRAs collected the information from alternative operators. It is also very common to use the information available from public sources (newspapers, studies, general statistics, etc) – 86% of the NRAs used these information sources.

As mentioned above, the use of surveys is also a common way for NRAs to collect information. 68% of the NRAs collected information using available surveys and 64% developed specific surveys to study the existence of substitution between mobile and fixed services. NRAs also gathered information from other market agents (27%) and other NRAs (9%).

**Figure 4. What information sources did you consider when analysing the possible integration of fixed and mobile services under the same wholesale/retail market?**



NRAs use many complementary sources of information and types of analysis to decide if mobile and fixed services should be integrated in the same market. BEREC believes that these various complementary ways of “looking” at the markets can be positive. In

this process NRAs should be aware of the advantages and drawbacks<sup>38</sup> of each type of analysis they use and, if necessary, NRAs should use complementary information sources to achieve a more robust analysis. However, the most important point regarding the information and analysis performed is that it is accurate and representative of the real competitive conditions existent in the market. This real picture of the markets will be essential for the NRAs to define the appropriate and most effective regulatory environment.

## 6. INFORMATION FOR FMS ANALYSIS

This section analyses the various types of information that NRAs may consider in order to assess whether fixed and mobile services should be considered in the same market. The analysis is focused on substitutability analysis performed in the retail voice and broadband markets.

In the questionnaire about FMS NRAs were asked whether each of the following types of information were relevant to an assessment of FMS:

- Differences in the offer characteristics between fixed and mobile services
- Market structure and strategy
- Analysis of bundled offers
- Comparison of the number of accesses
- Evaluation of the possible use of television services in mobile networks
- Historic and potential substitutability in fixed and mobile networks
- Terminal equipment differences
- Differences in end user's characteristics or service usage
- Existence of promotion programs for specific networks/services
- Specific supply issues
- End user satisfaction

NRAs were asked to rate whether each type of information was:

- Not applicable;
- Relevant to assess FMS **but not** a key parameter in the national context; or
- Relevant to assess FMS **and** a key parameter in the national context.

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<sup>38</sup> For instance, the IRG Expert Group that analyzed the Phase II case of the market for wholesale broadband access in Austria considered that: *"the results of customer surveys, though useful, have to be used with care. The Expert Group notes that there is often a large and measurable difference between stated preference in a survey/questionnaire and actual or revealed preference when analysing actual choices. Of particular importance is the consumer's response to a SSNIP type natural experiment relies on the consumer actually perceiving the relative price change (which can in a market such as the one under discussion arise when prices fall at different rates). In a response to a consumer survey no such issues arise"*.

NRAs were also asked to indicate if they have already used each type of information in retail market definition<sup>39</sup>.

In some cases BEREC presents some examples of how the information has been considered by NRAs while analysing FMS. The same information may be analysed by other NRAs resulting in different conclusions due to different specific circumstances in the countries.

At the end of this section BEREC will briefly discuss the main differences between performing the FMS analyses between voice services and broadband services and at the retail level and wholesale level.

### **6.1. Difference in offer characteristics between fixed and mobile services**

When NRAs analyse which services to include in a relevant market, they must consider (amongst other information) the characteristics of the services. This analysis will help NRAs to determine if the services considered are able to satisfy the same needs and, if so, whether they do this in a sufficiently similar way.

Put simply, the bigger the difference between fixed and mobile offers characteristics, the lower the potential substitutability between fixed and mobile services.

However, the existence or non-existence of differences between the offers is not the only matter that NRAs should look at. For example:

- The existence of some differences between offers that make a service less substitutable does not preclude the existence of other differences that may have an opposite influence regarding substitutability. For example, the price of offer A is higher than the price of offer B. But the downstream bandwidth of offer A can also be higher than the downstream bandwidth of offer B. So, despite the existence of differences between the offers they can still be substitutable; and
- Some differences between offers may not be relevant for certain consumers. For instance, this could be because the end-user's preferences and consumption patterns make the differences irrelevant (i.e. the end-user does not care about the differences<sup>40</sup>).

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<sup>39</sup> Some NRAs may consider the information relevant or even relevant and key parameter but not have used the information in the market analysis because when the market analysis was performed the information was not available or at that time it was not relevant for the analysis.

<sup>40</sup> Fixed broadband offers may have unlimited traffic limit and mobile broadband offers have a limit in terms of monthly traffic consumption. However, if the end-users don't reach the mobile broadband offers traffic limit this difference between the offers may be irrelevant for the substitution analysis.

## Questionnaire results

The questionnaire shows that most NRAs consider an analysis of the difference in the characteristics of fixed and mobile offers as relevant in assessing FMS. The majority of the NRAs also consider that this analysis is important within their national context. Almost all NRAs stated that they have already considered the differences between fixed and mobile offers while defining retail markets for broadband and voice services.

NRAs consider that the most relevant points to analyse regarding the differences between fixed and mobile broadband offers are: the price level, the downstream bandwidth and the existence of limitations in the usage of the services (traffic limits). Regarding voice service offers, the most relevant offer characteristics to consider are the price level and the price structure.

### ***Retail broadband Access market - Austria***

RTR recognized that the speed of internet connection was an important driver of competition and that mobile internet provided, on average, lower speed connections compared with fixed internet. RTR also verified that the average price for mobile internet connections was lower than the price for fixed internet connections. In addition, mobile internet connections provided the feature of mobility.

A survey<sup>41</sup> showed that the main applications used by fixed as well as mobile broadband users are e-mailing and surfing the web. These applications do not require high or particularly stable bandwidths. But even for other applications like downloads of large quantities of data, internet telephony, online games or online banking, there is a significant share of mobile broadband users who frequently use these applications. The difference in speed therefore does not seem to have a strong impact on the applications used. RTR therefore concluded that the difference in average download speeds between fixed and mobile broadband was not sufficiently large (and was compensated by other factors such as lower price and mobility) and that the two products could be included in the same market in the residential segment.

Source: RTR

### ***Broadband Access market – UK***

Ofcom mentioned in its analysis that:

<sup>41</sup>To get detailed information about the demand at the end-customer level a survey was conducted on about 3 000 households and approximately 1 000 undertakings. In this survey, data was collected about the usage of Internet connections and about (potential) substitution behaviour.

- *“...mobile broadband packages (offered via a USB modem or “dongles”) tend to have a fraction of the download limits compared to fixed broadband access...”;*
- *“...Current maximum speeds for mobile broadband access advertised are 7.2 Mbps, with most people generally achieving less than 1 Mbps on average. This is a fraction of the speeds achieved through fixed broadband access. As such, for video streaming it is unlikely that a mobile broadband service can offer a comparable service quality. In addition, given that a 30 minute TV programme streamed online would use around 175MB, a 1GB download limit could only provide less than 3 hours worth of video streaming...”.*

In this case, the differences between the mobile broadband offers and the fixed broadband offers supported Ofcom’s decision to exclude mobile broadband access from the retail product market definition.

In the analysis of the differences between mobile and fixed broadband offers Ofcom also considered consumers’ preferences and consumption patterns: *“Increasingly popular online activities such as content streaming and sharing are more likely to be bandwidth hungry services. Ofcom’s research showed that catch-up TV<sup>42</sup> grew by a third over the year to Q1 2010 to be used by 31 per cent of internet users. Consumers watched an average of 48 minutes of video content accessed via an internet connection per week, or just over 3.5 hours per month”.*

Source: Ofcom<sup>43</sup>

## **6.2. Market structure and strategy**

If mobile and fixed operators belong to the same company it is possibly more likely that bundles of fixed and mobile voice services (possibly including broadband and TV services which means quadruple play) will be offered more frequently to the end user (“one stop shop”). Whether or not this type of market strategy is followed will mainly depend on consumer preferences. Some consumers may regard a single invoice for a number of different services and a customer service team that can deal with a multitude of queries regarding different services as a compelling proposition, whereas others will be price-focused and may use different providers if that is more cost-effective. There may also be customers for whom fixed voice services are no longer a key requirement, and such customers may be less interested in a one stop shop offering.

<sup>42</sup> Term used to describe VOD in which TV shows are available for a period of days after the original broadcast.

<sup>43</sup> <http://stakeholders.ofcom.org.uk/consultations/wba/wba-statement/>

If the network operators do pursue a one stop shop strategy, it will be important for each fixed/mobile operator not to cannibalise their own fixed/mobile segment. One of the ways in which operators may seek to ensure there is no cannibalisation of other products in their portfolio is to follow a strategy whereby certain products are aimed at certain parts of the market. For example, a network operator with both a fixed and a mobile network may aim fixed and mobile voice at different value segments (e.g. low value vs. premium segment).

Furthermore, NRAs should consider in their analysis of substitution the existence of aggressive strategies of integrated mobile/fixed network operators to gain critical mass in the market (e. g. strong promotion programmes for new customers). Such market strategies could have a significant influence on customer's loyalty to its existing network operator as well as their preferred way to communicate (fixed vs. mobile voice/broadband). These strategies may also create more or less temporary changes in the adoption of different technologies and networks by the end users.

The effects of substitution may be higher in a market structure dominated by stand-alone fixed/mobile network operators, whereas complementary effects may be more probable within a market of bundled offers by integrated fixed/mobile network operators. Therefore market structure and market strategy of fixed/mobile operators and their competitors could be essential for a further analysis of substitutability.

### **Questionnaire results**

The results of the questionnaire show that most NRAs consider that an analysis of market structure and market strategy is relevant or even a key parameter in assessing FMS for both voice and broadband. About one half of NRAs have already considered it when looking at retail market definition for broadband and about one third of NRAs when looking at retail market definition for voice. Only a small minority of NRAs consider that any kind of cooperation between fixed/mobile operators and the level of competition in the fixed/mobile segment are not applicable. As far as the existence of an aggressive market strategy by a network operator is concerned one half of NRAs believe this is relevant but not essential whereas the other half of NRAs consider this either as not applicable or a key parameter.

### **6.3. Analysis of bundled offers**

When NRAs analyse FMS it may be important to consider whether there are differences in the bundles of fixed services and mobile services offered which could affect substitutability between the two.

In order to purchase a fixed broadband service, a consumer needs to rent the access line to their property. Since this line is also needed to provide the fixed voice service it is common to sell fixed voice and broadband services as a bundle. A mobile voice and fixed voice service may be considered by some consumers to offer a functionally similar service in the home, but because fixed networks tend to offer better broadband speeds a bundle of mobile voice and broadband services may not be viewed as equivalent to the fixed alternative. As superfast (fixed) broadband is rolled out to more households the difference in the speed of fixed versus mobile broadband may become even greater. However, where high speed mobile broadband (LTE) is available this may make mobile access technology a real alternative.

As discussed below, fixed services currently have a higher capacity to offer television services than mobile services. If consumers prefer to buy a bundle of telephony, broadband and television services together then mobile may be less likely to be seen as a substitute for fixed. The extent to which this matters depends on how consumers purchase services e.g. do they prefer to purchase a bundle of services together or the individual elements (which in turn may link to price and the structure of the offers).

It is worth considering which part of the bundle consumers value most in order to understand what is driving consumer demand. For example, the fixed voice component of a bundle may be largely seen as an ancillary service, with access to fixed broadband driving demand. It is useful to understand these dynamics in an assessment of FMS.

However, bundling is not necessarily a barrier to FMS as is shown in the example below.

#### **Analysis of bundles in Austria**

In its analysis of broadband FMS RTR found that bundles including fixed broadband were relatively common (58% of DSL and CATV users purchased fixed voice alongside fixed broadband, and 36% purchased TV alongside fixed broadband). However, around 20% of DSL and CATV users purchased their internet connection as a standalone service. Also RTR noted that many households had given up their fixed voice access in the past as prices for mobile telephony decreased. This indicated that a significant share of people would be willing to give up their fixed voice access when switching to mobile broadband.

Finally, RTR noted that in Austria the majority of households use a satellite (~50%) or terrestrial antenna (5-7%) to receive TV signals limiting the potential for multi-play bundles including TV. RTR concluded that there seems to be enough potential



switching to find FMS despite the fact that many fixed broadband users buy two or more services from the same operator.

Source: RTR

It is also relevant to consider whether bundles include fixed and mobile services (e.g. offers which provide fixed and mobile telephony). Such offers would indicate that fixed and mobile services are viewed mainly as complements rather than substitutes.

### Questionnaire results

The results of the questionnaire show that most NRAs consider that an analysis of bundled offers is relevant in assessing FMS for both voice and broadband, and a number of NRAs have already considered it when looking at retail market definition for voice and broadband. Quadruple play bundles are generally considered relevant by NRAs but relatively few see them as currently important within their national context.

#### 6.4. Comparison of the Number of accesses/Penetration Evolution

If households generally take both fixed and mobile services then the two are more likely to be complements than substitutes. NRAs could look at the trend in uptake over time to determine whether substitution from fixed to mobile is increasing over time e.g. through consideration of how many households only have a mobile service. The evolution of the percentage of mobile only households can help to determine whether mobile is seen as a viable alternative to fixed services and possibly the future trend<sup>44</sup>. However, it is also important to consider the reasons behind any trends – see historic and potential substitutability below.

#### ***Retail narrowband access market – UK***

Consumers appear to have a strong preference to purchase both fixed and mobile access in the UK; most (circa 80%) consumers have both mobile and fixed voice access.

Analysis for the retail narrowband market review in 2009 found that despite a large fall (around 45%) in the prices of mobile services between 2002-2007, mobile only households grew from 7% to 10% while the proportion of consumers with both fixed and mobile access increased from 73% to 82%. This is consistent with consumers

<sup>44</sup> However, one must be cautious when interpreting mobile-only household figures. It may be the case that some of these mobile-only households represent a new source of market demand for which mobile internet suits a particular need (e.g. for those who didn't previously use or were unable to access fixed broadband services). Such a market expansion effect would thus not necessarily derive from FMS but rather from mobile internet addressing an untapped or previously unavailable market niche.

taking advantage of falling mobile prices by increasingly purchasing both mobile and fixed access, rather than substituting away from fixed line.

Source: Narrowband Retail Services Market Review 2009<sup>45</sup>

### Questionnaire results

The majority of NRAs consider that the evolution of fixed and mobile accesses over time is a relevant factor within the national context in assessing FMS, and most have already considered this factor within retail market definition. The percentage of households with each type of access is also generally considered relevant within the national context. There is a limited difference between voice versus broadband.

### 6.5. Evaluation of the possible use of television like services in mobile networks

Generally, fixed networks have a higher capacity to offer television services to end users than mobile networks. This may have consequences for the existence of substitutability between fixed and mobile services.

This issue is especially relevant when most end-users buy the voice or the broadband service bundled with television services. Conversely this issue is less important when TV services are mainly sold as single services (not bundled) and end-users can substitute broadband and fixed and mobile voice services without considering these services' capability to provide TV services.

Mobile operators have been implementing technological innovations and solutions that are allowing end-users to access TV-like services through mobile networks. These kind of solutions are being achieved through: traffic management in mobile networks, unmanaged services supported in the mobile networks (broadband television); and the use of a combination of different technologies/networks (e.g. satellite to provide television and mobile networks to provide voice and broadband).

The possible substitution of fixed television services by "mobile television services" depends not only on the solutions available in the different countries but also on the preferences and choices of the end-users in each country.

When assessing the existence of substitutability between mobile and fixed services, NRAs should consider all these matters taking into account the relevant information available that might indicate that TV services could be an important obstacle to substitutability between fixed and mobile services.

<sup>45</sup>Available at [http://stakeholders.ofcom.org.uk/binaries/consultations/retail\\_markets/summary/fnrsm\\_condoc.pdf](http://stakeholders.ofcom.org.uk/binaries/consultations/retail_markets/summary/fnrsm_condoc.pdf)

## Questionnaire results

The majority of the NRAs consider that the evaluation of the possible use of television-like services in mobile networks is a relevant parameter to consider when analysing whether fixed and mobile broadband offers should be included in the same retail market. 5 of the 16 NRAs who considered this parameter relevant thought that it was key within the national context. In general, NRAs consider that the most relevant issue is the penetration of bundles integrating TV services in fixed and mobile networks.

The results showed that use of television-like services is less relevant in an assessment of voice than broadband FMS. Nevertheless, there are a number of NRAs that state that this evaluation can be relevant and some of them even state that some specific issues related to this evaluation are a key parameter in their national context (i.e. Availability of applications & services allowing TV (or similar) in mobile networks, Penetration of bundles integrating TV services in fixed and mobile networks).

When undertaking retail market definition, NRAs tend to consider television-like services more frequently when dealing with broadband services than voice services.

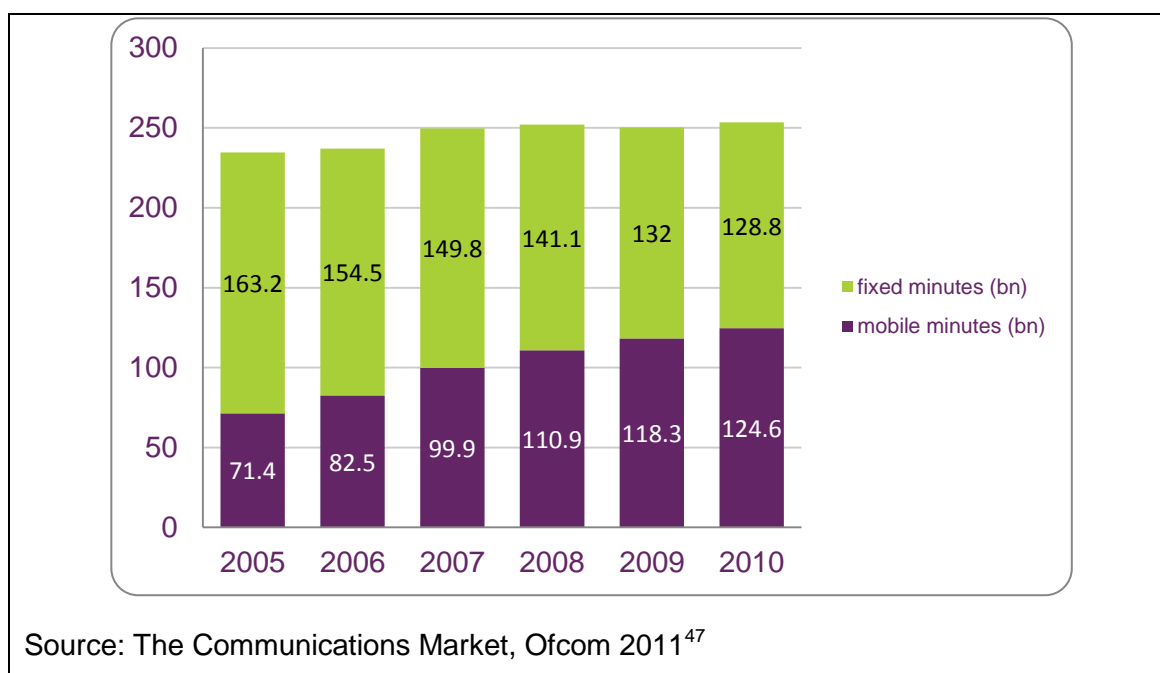
### 6.6. Historic and potential substitutability between fixed and mobile services (including influence of price)

NRAs can look for trends in substitution between fixed and mobile services and analyse likely causes. This can help to determine the future trends and potential barriers to substitution. This is linked to the assessment of fixed and mobile access penetration above. For example, the trend in mobile only households over time can provide information on the number of households switching from fixed to mobile services<sup>46</sup>. It is also important to consider what is driving any change. For example, households could be switching to mobile or fixed only services to save money in a recession, which could be reversed in different economic circumstances.

#### ***Fixed and mobile call minutes – UK***

The chart below shows total fixed and mobile minutes in the UK over time. Overall call volumes (fixed and mobile) have increased by 8% between 2005 and 2010, while mobiles share of call volumes has increased from 30% to 49%. Mobile minutes have increased by 53 billion between 2005 and 2010 while fixed volumes have declined by 34 billion. This suggests that while there has been some substitution from fixed to mobile calls, some of the growth in mobile calls has been caused by new calls.

<sup>46</sup> As noted in footnote 44, this information does need careful interpretation.



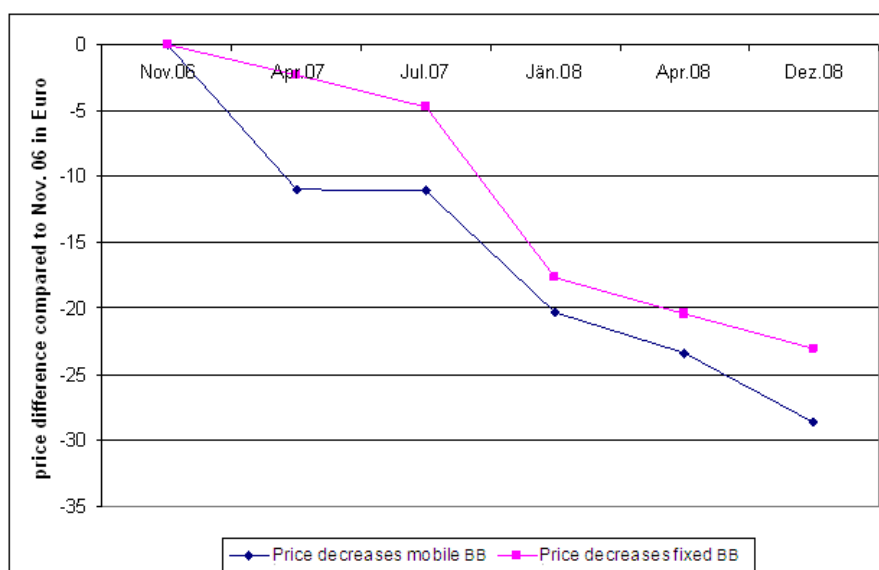
It is also relevant to look at price evolution over time. For example, are prices for mobile/fixed services tending to converge (indicating possibility of competitive constraint) or are prices diverging? It is relevant to consider the structure of pricing and how this has changed over time e.g. whether minutes are sold in bundles (at a flat rate regardless of the number of minutes used) or charged per minute. A further consideration is whether there is a relationship between price movements in mobile and fixed services. However, such analysis needs to be interpreted with caution because there could be a number of factors which influence price movements.

#### ***Fixed and mobile broadband prices – Austria***

The chart below shows how prices evolved for fixed and mobile broadband services in Austria.<sup>48</sup> It shows that the prices of fixed and mobile broadband move closely together and that fixed broadband providers reacted to a strong price decrease by mobile operators in early 2007 by a strong price cut in Dec 07/Jan 08 (when mobile operators again significantly reduced prices). Prices of both products have further decreased since then. This was seen as evidence for a competitive constraint from mobile on fixed broadband, in particular, when considered in conjunction with fixed and mobile broadband growth rates. After the price cut for mobile broadband, fixed broadband growth rates decreased significantly (to almost zero). They only increased again after prices were significantly reduced in the fixed segment.

<sup>47</sup> Available at [http://stakeholders.ofcom.org.uk/binaries/research/cmr/cmr11/UK\\_Doc\\_Section\\_5.pdf](http://stakeholders.ofcom.org.uk/binaries/research/cmr/cmr11/UK_Doc_Section_5.pdf)

<sup>48</sup> This chart is based on a hedonic price regression, i.e., the price is regressed on product characteristics and period-dummies (0/1-Variables, 1 in the respective period, 0 otherwise). The period dummies (depicted in the chart) capture price differences (compared to the first period, here November 2006) not accounted for by differences in product characteristics.



Source: RTR

As noted in section 3.2, the SSNIP test is a useful tool to investigate how consumers would react to a price change and the extent to which consumers view fixed and mobile services as substitutes e.g. would consumers switch from fixed to mobile access in response to a 10% increase in the price of the fixed service? It can also be useful to investigate the extent of any competitive constraint. However, it is important to note that this is a hypothetical test and the results must be interpreted cautiously i.e. it may not reflect how consumer actually behave in real life.

Consumer preferences are an important consideration in assessing potential substitutability. For example, are consumers unlikely to give up fixed line services because of inertia/because it helps them to feel secure. It is important to consider both functional differences and perceptions when assessing substitutability.

#### ***Retail narrowband consumer survey – UK***

Consumer market research carried out in 2008 found that demand for landlines in the UK was primarily driven by non price factors. When respondents were asked about their attitudes to having a landline:

- 62% agreed with the statement “never give up landline – feel secure having one”
- 44% agreed with the statement “there is too much upheaval to get rid of home phone”
- 43% stated that “mobile is not reliable enough to drop the landline”
- 26% said they “only have a landline for the internet”.

Source: Narrowband Retail Services Market Review 2009

## Questionnaire results

The questionnaire results show that the ‘hypothetical monopolist test’ is a relevant tool for assessing FMS. A significant number of NRAs have already used this test within retail market definition for both broadband and voice. Historic data about switching between fixed and mobile services, reasons for future switching and barriers to switching are also generally considered important. More NRAs appear to have considered these three factors in voice rather than broadband retail market definition. A comparison of contract duration between fixed and mobile services is generally considered less important – a significant minority of NRAs considered this factor is not applicable for an assessment of FMS.

### 6.7. Terminal equipment differences

In general terms, the potential substitutability between fixed and mobile services can be dictated to a large extent by the differences in price and in functionality of terminal equipments. For example, for cost-conscious customers, a significant price difference between fixed line handsets and mobile handsets may be a key decision making factor if the use to which both types of handsets are put are similar. Furthermore significant subsidies made by network operators for terminal equipment may affect the end users decision to switch from fixed line to mobile access or vice versa.

In other words, if consumers only make voice calls and do not require the mobility that mobile handsets provide, there may be limited substitution between cheaper fixed line handsets and more expensive mobile handsets. Equally, if consumers have preferences to use their mobile handsets for more than simple voice calls (i.e. using a “smartphone” for emails, social networking etc), this is likely to reduce the substitutability of those mobile handsets with fixed line handsets.

The above example shows that the existence of price differences is not the only factor that NRAs should look at. Various others factors may exist that are relevant to a consumers decision as to what type of fixed/mobile handset to purchase. In this regard, non-price factors can play a part such as a consumer’s affinity to certain gadgets/equipment (e.g. iPhones) or the possibility to send SMS (which means a strong preference for mobile access). It may also be important to consider fixed access within a household as the focal point of family communication whereas mobile devices would be individually linked to each family member (i.e. it is quite unusual that parents and their children share the same mobile phone).

On the other hand, the number of houses with multiple computers does not seem, in general, a very important parameter for this analysis (see below questionnaire results).

***Existence of multiple computers is not an obstacle for substitutability – Austria***

With regard to fixed-mobile broadband substitution, the question arose whether a high share of households has multiple computers and whether mobile broadband can be used at more than one computer. Survey results showed that the majority of households had only one computer. Aside from that there was also the possibility to use mobile broadband on more than one computer with a router (similar to a W-LAN modem). According to RTR two or more mobile connections could even be cheaper than a fixed connection with W-LAN (depending on usage), since mobile broadband was already available for 4 € for 1 GB per month.

Source: RTR

**Questionnaire results**

The majority of NRAs consider that the terminal equipment of fixed and mobile access is a relevant but not a key factor within the national context in assessing FMS. A minority of NRAs have already considered this factor within retail market definition. There is a limited difference between voice and broadband in the case where households own multiple computers.

The percentage of households with multiple computers in the broadband segment is mostly regarded as not applicable which is not surprising due to the considerations mentioned above. Nevertheless a small minority used this element in retail market definition for broadband.

**6.8. Differences in end user characteristics or service usage**

A consideration is whether substitutability between mobile and fixed is more likely for particular groups of consumers, and how differences in end user characteristics might influence attitudes towards substitutability.

There may be particular functional features which end users are looking for that influence the degree of substitutability. For example, if an end user has a requirement for video streaming then mobile broadband may not be appropriate due to lower achievable speeds. Certain groups may view the speed and quality of a fixed broadband service as 'essential'. The view on substitutability may depend on what the service is used for.

End users' perceptions may also be important. For example, some consumers may not consider mobile broadband as providing the necessary security to carry out online banking activities.<sup>49</sup>

A further consideration is whether consumers have particular ways of using fixed and mobile services<sup>50</sup> e.g. use mobile when on the move, use fixed when in the home.

In relation to the above:

- PTS (Sweden) noted that for wholesale markets 4 and 5<sup>51</sup> wireless alternatives do not meet the functionality demands of wholesale customers and would not be considered a substitute according to the hypothetical monopolist test.
- HAKOM (Croatia) considered that retail mobile broadband access was not a substitute to fixed broadband access due to lower coverage by HSDPA signal and the fact that quality and speed depend on the number of simultaneous users in the mobile network.
- CRC (Bulgaria) noted that technical characteristics of the mobile service (mobility, specific equipment) are the main reason why mobile and fixed services do not belong to the same retail market.
- NMHH (Hungary) noted that one reason for non-substitutability at the retail level was differences in consumer usage and that the product characteristics (functionality, quality) are different.
- Some NRAs noted that a fixed call can be substituted with a mobile call, however, the reverse is not true (due to the mobility associated with mobile access).
- ANCOM (Romania) noted that one reason for non substitutability of mobile for fixed access at a retail level is that fixed access is associated with an entire household, but mobile access is perceived as personal and usually used by one person.

#### **Types of consumer with mobile only access - UK**

In the UK Ofcom has found it more likely that low income households have mobile access only. A consumer survey in 2008 found that 24% of UK adults with an income of less than £11.5k used mobile voice services only, compared to only 5% for those with

<sup>49</sup>Some consumers might perceive health issues (e.g. around radio waves) associated with prolonged mobile use which might influence the desire to substitute from fixed to mobile (for high volume use).

<sup>50</sup>For example, a narrowing in the difference between the average call length for fixed and mobile calls could be one possible indicator of FMS.

<sup>51</sup>Market 4 is wholesale (physical) network infrastructure access (including shared or fully unbundled access) at a fixed location and market 5 is wholesale broadband access from the EC Recommendation on relevant markets



an income in excess of £30k. It is also possible that particular groups of consumers are more likely to be mobile-only - for example those living in rented accommodation and those who move around a lot (e.g. students).

Source: Ofcom

### Questionnaire results

The questionnaire results indicate that consumption patterns and use of access (for broadband) tend to be more relevant in an assessment of FMS than end user characteristics or security. In particular, a significant minority of NRAs thought that differences in security between fixed and mobile services while using some applications (e.g. home banking) were not applicable for either voice or broadband. For voice, a significant minority of NRAs considered that differences in the use of the fixed and mobile access were not applicable. Conversely, for broadband, differences in use of access (e.g. it can be used for emails, video streaming, home banking etc) were generally considered a relevant factor and key within the national context. This is probably because voice access has a more limited number of applications relative to broadband.

Differences in end users characteristics (e.g. income, education, age) were considered a relevant factor by most NRAs, but generally were not important within the national context for either voice or broadband (and a significant minority considered it not applicable). Differences in consumption patterns between fixed and mobile users (e.g. usage frequency, duration) were considered a relevant factor by most, and around half of NRAs answering the question had already considered this point in retail market definition for voice and broadband.

### 6.9. Existence of promotion programmes for specific networks and services

NRAs should consider the possible existence of promotion programmes for specific services/networks that may influence the decisions of end users regarding the acquisition of a mobile or fixed service. If NRAs can identify such programmes, they can analyse the influence on end users' acquisition decisions and also on operators' investment decisions. For instance, NRAs may estimate the real level of adoption of a service if the promotion programme was not available and consider that information in its substitution analysis.

The conclusions regarding substitutability between fixed and mobile services should take into account the analysis performed and the influence of the programme on the decisions of the market agents.

### ***The Portuguese “e.iniciativas”***

The national policy for the information society and promotion of access to broadband was defined through the programme Ligar Portugal, launched by the government in 2005. In order to generalize the access to laptops and broadband by the least-favoured social groups the Portuguese government launched the e.iniciativas (“e.initiatives”) in 2007.

Those eligible for this programme have access to a laptop plus a mobile broadband internet access. Those taking part in the programme usually pay an initial payment plus a monthly payment (lower than the “normal” monthly payments”), during a minimum contractual period. The eligibility to this programme and value of the payments depend on the economic conditions of the candidates.

The three UMTS<sup>52</sup> licensees adhered to e.iniciativas consistently with commitments assumed on tendering procedures for the attribution of their licenses. The offers available from each operator vary, but they guarantee several download and upload speeds, traffic and monthly cost.

According to the data available this initiative led to a very significant increase in the number of laptops and the level of mobile broadband access: about 1 million out of a total of 1.3 million mobile broadband users are from the from e-initiatives programmes at the end of 2010 (77% of the total mobile broadband users).

In the broadband access market review of January 2009 ANACOM considered the mentioned fact as one of the reasons why there was not a relevant substitution at the retail level between fixed and mobile broadband access services.

Source: ANACOM<sup>53</sup>

### **Questionnaire results**

The majority of the NRAs consider that the existence of promotion programmes for specific networks/services is a relevant parameter to consider when evaluating the possible integration of fixed and mobile services in the same market. These NRAs state that when analysing this parameter it is important to consider the existence of specific programmes promoting the use of mobile or fixed services and the relation between adoption of the use of mobile/fixed service and the existence of the promotion programme.

<sup>52</sup>Universal Mobile Telecommunications System.

<sup>53</sup> Study on the impact and adhesion to e.iniciativas - Final Report:  
<http://www.anacom.pt/render.jsp?contentId=1000836>.

There are, however, a small number of NRAs that consider that this is a key parameter to analyse within their national context and a significant number of NRAs consider that this parameter is non-applicable in their specific case.

The information regarding the existence of promotion programmes for specific networks/services has rarely been used in retail voice services market definition. It has been used more frequently in broadband services retail market definition but nevertheless remains relatively uncommon.

### **6.10. End user satisfaction**

An assessment of the end user satisfaction with fixed and mobile services can help to determine why consumers use fixed and mobile services, identify the possible barriers to substitution and provide information about consumer perceptions. This can be helpful to consider alongside the information under the other categories above. It can be helpful to uncover those factors influencing demand other than price. For example, in an Ofcom 2008 survey of businesses, 62% cited reliability of mobile service/coverage as a reason why mobiles are not appropriate substitutes to landlines. If a consumer is generally happy with a service then they may be less likely to look for a substitute.

#### ***Important features of mobile broadband service – UK***

##### **Reliability ranked the most important feature of a mobile broadband service**

A study of mobile broadband sought to understand what aspects of a mobile broadband package could be most valued by users, with a stated preference analysis conducted. An index score was developed, showing the relative importance of a range of issues to users when they are considering getting a new mobile device to access the internet. The most important issue across all users was the reliability of the connection. Most of the other factors (such as value for money or good customer service) may be desirable, but being able to get a connection is essential if the mobile broadband service is able to be used.

Source: Ofcom consumer experience 2010<sup>54</sup>

### **Questionnaire results**

The questionnaire results show that most NRAs consider end user satisfaction as a relevant parameter in assessing FMS, but it is often not key within the national context and has not been used widely in retail market definition (especially for voice). Levels of

<sup>54</sup> Available at [http://stakeholders.ofcom.org.uk/binaries/research/consumer-experience/tce-10/TCE10\\_Choices.pdf](http://stakeholders.ofcom.org.uk/binaries/research/consumer-experience/tce-10/TCE10_Choices.pdf)

satisfaction and dissatisfaction with fixed/mobile services were considered broadly equal in relevance.

### **6.11. Specific supply issues**

Supply-side substitution is a crucial point to consider in market definition, where its effects are equivalent to those of demand substitution in terms of effectiveness and immediacy, i. e. where suppliers could switch production to the relevant products and market them quickly in response to a SSNIP without incurring significant additional costs or risks. The lower the cost differences for switching between mobile and fixed infrastructure the wider the scope for supply-side substitution. However, it might also be necessary to consider any differences in capacity to deliver mobile or fixed services. NRAs have to take into account that companies who are currently not active in the fixed or mobile market may decide to enter the relevant market which would increase substitutability.

However, operators may face significant investment obstacles (e.g. network investment, mobile licences) so substitutability can be difficult to achieve. There may also be other reasons as to why a potential new entrant may be constrained from entering the markets with sufficient immediacy – brand awareness, customer reluctance to switch providers and technical barriers must all be considered by NRAs before a reasoned and fully supported conclusion can be reached on the question of market definition.

In relation to differences in capacity, in theory LTE availability based on a very high speed of data transfer may enhance the existence of substitutability between fixed and mobile services. On the other hand the availability of even faster NGA products in fixed networks may constitute an obstacle for the existence of substitutability. In any case, if the current gap of broadband speed between fixed and mobile services significantly decreases, the possibility of substitutability may be greater from a specific supply perspective.

Finally depending on the characteristics and coverage of the mobile and fixed networks in particular areas, it is possible that substitutability exists in some geographic areas but not others.

### **Questionnaire results**

The questionnaire results show that most NRAs consider specific supply issues as a key element for assessing FMS of broadband and voice. A significant number of NRAs have already used this test within retail market definition for both broadband and voice.

The level of cost differences as well as capacity differences between mobile and fixed services, geographic differences in bandwidth and differences in network coverage are generally considered most important for broadband substitutability. As far as voice substitutability is concerned, the key parameters are the level of cost differences between mobile and fixed services and differences in network coverage.

## **6.12. Differences in the information used for FMS analysis**

### **Voice vs. Broadband**

In general, the type of information considered in an analysis of FMS for voice and broadband is similar. In particular, the information which NRAs classify as relevant and a key parameter in their national context tends to be the same for voice and broadband.

The main differences between voice and broadband services in the information considered for FMS analysis relate to the specific characteristic of these services<sup>55</sup>.

### **Retail vs. Wholesale**

This report is focused on an analysis of FMS and its implications on market definition at a retail level. However, the questionnaire tried to identify the most relevant points to consider regarding the analysis of FMS at a wholesale level.

In general, if FMS does not exist at the retail level it is not feasible to have FMS at the wholesale level (if retail consumers do not perceive fixed and mobile offers as substitutable it is not likely that operators will consider the possibility of changing from a fixed wholesale access to a mobile wholesale access or vice versa). For this reason the information that is relevant for FMS analysis at the retail level is also relevant for FMS analysis at the wholesale level.

Besides this “retail level information”, if an NRA is interested in analysing the possible existence of direct substitution at the wholesale level, a specific FMS analysis considering “wholesale level information” is necessary<sup>56</sup>. This information would be used to analyse the possibility of operators changing from a fixed wholesale access to a mobile wholesale access and vice versa. Relevant factors to consider include the availability and conditions of the fixed and mobile wholesale access (price, service characteristics, QoS, etc) and the cost involved to switch between fixed and mobile access.

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<sup>55</sup>e.g. the downstream bandwidth is usually considered a very relevant information to take into account when analysing FMS in broadband services that is obviously not applicable for FMS analysis in voice services

<sup>56</sup>By direct substitution we mean: operators changing from fixed/mobile wholesale access offers to mobile/fixed wholesale access offers.

Even if there is no direct FMS at the wholesale level there is still the possibility that the wholesale market definition is influenced by the existence of FMS at the retail level: the actions of the wholesale access provider might be significantly constrained by the possible existence of FMS at the retail level leading to the inclusion of fixed and mobile services under the same wholesale market (even without direct wholesale substitution)<sup>57</sup>. If NRAs wish to analyse this possibility detailed information about indirect constraints at the wholesale level due to FMS at the retail level is needed<sup>58</sup>.

## 7. POTENTIAL IMPACT OF FMS ON FIXED MARKETS FAILURES

The impact of FMS on traditional fixed markets failures can be assessed by differentiating between downstream (retail) and upstream (wholesale) markets.

### 7.1. Retail markets

In downstream markets, there are two possible scenarios: (1) when FMS is strong enough to consider fixed and mobile services to be in the same market, and (2) when that is not the case.

#### Scenario 1

If FMS is sufficient to define a single market for fixed and mobile services, then we would expect a direct positive impact on the competitive situation of fixed markets. In this case, competition between mobile and fixed networks may be expected to reduce the market power of the fixed incumbents due to infrastructure-based competition.

Under this scenario, the fact that the fixed incumbent network operator has a large share of the fixed market may no longer represent a competition issue (i.e. because its market share in the combined fixed and mobile market may be smaller<sup>59</sup>). However, this will depend on whether the fixed operator has a mobile division and its position in the mobile market. A full assessment considering all relevant factors would be necessary to determine if the retail market including fixed and mobile services is effectively competitive.

If the market is considered to be effectively competitive the imposition of ex ante market regulation for solving competition problems in the retail markets might not be necessary to the extent that platform competition is sufficient to ensure, in the long

<sup>57</sup>The next section of this report briefly addresses this possibility.

<sup>58</sup>For a more detailed analysis of this question and of the information that can be useful please consider: BoR (10) 09 BEREC report on self supply.

<sup>59</sup> However, it may also be necessary to consider whether the fixed operator has a mobile division and its position in the mobile market.

term, consumer needs are adequately met in terms of the price, choice and quality of services delivered.

Additionally, it would be necessary to monitor the evolution of market conditions to avoid potential threats such as (implicit or explicit) collusion.

#### **Broadband retail access fixed-mobile - Austria**

As noted above, RTR concluded that mobile broadband connections were adequate substitutes for DSL and cable broadband connections in the residential market. As a consequence, due to mainly infrastructure-based competitive pressure exercised by mobile network operators, cable network operators and unbundling operators, RTR considered that a trend towards effective competition can be identified as regards the residential customers' retail broadband access market. These findings led RTR to the conclusion that only the wholesale broadband access market for bitstream connections for the subsequent use of business customers may warrant ex ante regulation.

#### **Scenario 2**

Even if fixed and mobile services are not considered to be in the same market, FMS may have implications for fixed market failures because the degree of competition/substitution may solve some of the traditional problems. This may be considered (i) when analysing if the three criteria for imposing ex ante regulation are cumulatively met, (ii) in the SMP analysis or (iii) when NRAs are evaluating the appropriate obligations to impose in the markets.

The existence of differing levels of FMS may mean that some remedies can be relaxed or are no longer needed. For example, NRAs may modify the remedies in order to allow the incumbent more commercial flexibility in its retail offers for a specific group of consumers who do substitute fixed services for mobile ones. This outcome might be appropriate where differences among this specific group of customers compared to other customers are not yet sufficiently stable or sustainable to justify the definition of segmented markets for these specific categories of customers.

#### **Retail fixed access market - Spain**

CMT uses a margin squeeze methodology in the ex ante analysis for the commercial offers of the fixed incumbent (Telefónica). Depending on the level of competition different types of tests are conducted for bundled offers: Individual replicability (Implicit price test) or joint test (less conservative than the first test).

In the framework of the second round of retail fixed access market analysis (market 1 of Recommendation on relevant markets), a group of customers were identified whose telephone use was so low that the fixed operators would face a competitive pressure from mobile operators, via their bundled offer for access and calls over mobile networks.

Therefore, the level of competition for that group of customers was increased due to a sufficient degree of FMS. For that reason, CMT has since used a more relaxed test (the joint test) for bundles with retail access to PSTN and fixed telephone calls for clients with a monthly expenditure of less than €20.

### **Fixed access and calls markets – Finland**

As noted in Section 3, when defining the product markets for retail access, FICORA concluded that retail mobile access is a distinct adjacent product market exercising competitive constraints on fixed access services.

Due to these competitive constraints FICORA withdrew the existing SMP designations in the fixed access and local calls markets

As discussed in section 3.2, the effect of asymmetric substitution may be considered in other phases of the market analysis rather than as part of the market definition. In this case a single market for fixed and mobile services (scenario 1) may not be defined. However, whether the competitive constraints of asymmetric substitution are considered in the market definition phase or in other phases of the market analysis should not affect the final result.

## **7.2. Wholesale markets**

FMS is mainly a retail issue and it is less likely to happen at the wholesale level. Notwithstanding, the possible existence of FMS at the retail level may significantly influence the wholesale markets through indirect constraints, especially in markets 2 and 5 since they are closer to the consumers in the value chain, but it could also happen in market 4<sup>60</sup>.

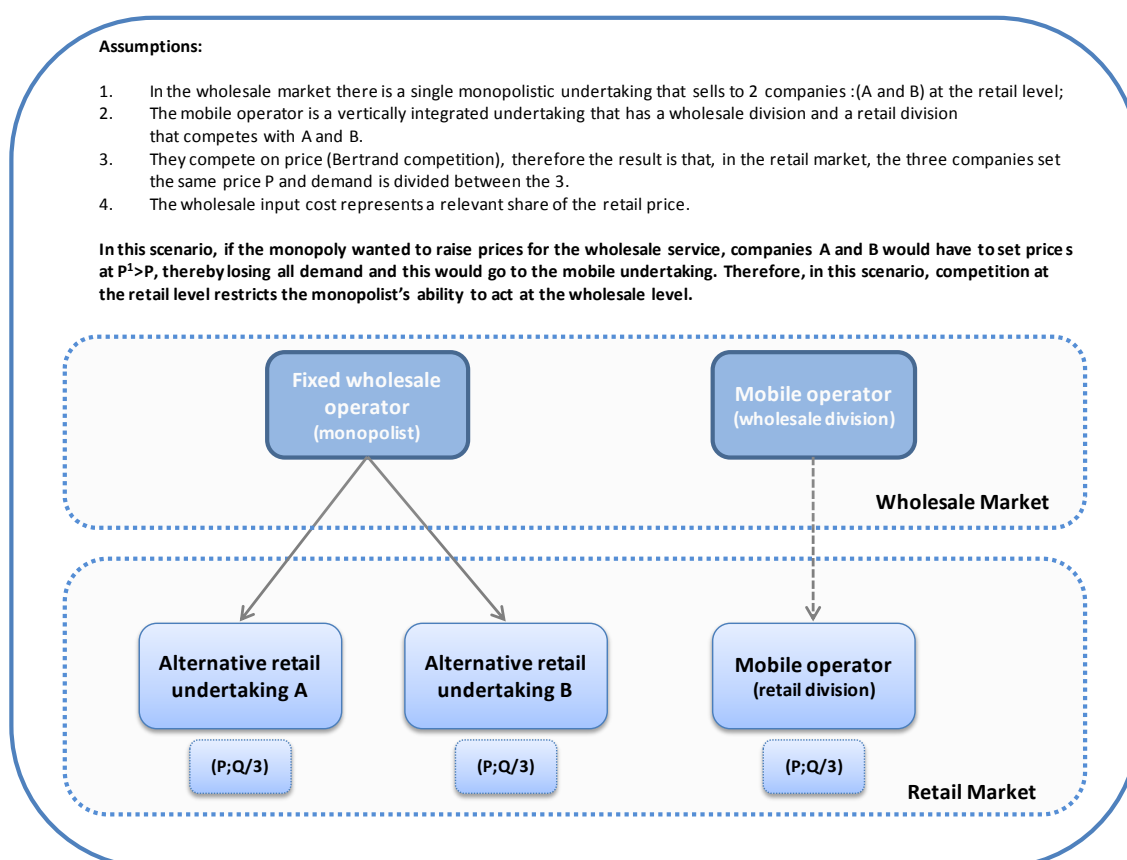
Where vertically integrated operators are present in the wholesale and retail markets, it is important to analyse to what extent this self-provision should or should not belong to the same relevant market; that is, to what extent can vertically integrated operators exercise enough competitive pressure on the behaviour of wholesale providers that offer their services at the wholesale level.

<sup>60</sup> Markets from EC Recommendation on relevant markets: Market 2 is Call origination on the public telephone network provided at a fixed location, Market 4 is wholesale (physical) network infrastructure access (including shared or fully unbundled access) at a fixed location and market 5 is wholesale broadband access.



For example, when faced with a SSNIP at the wholesale level, retail operators using those services may (depending on the relative share of this wholesale inputs in the retail price) need to pass this price increase on to end-users, which would mean a decrease in demand in favour of integrated operators and, therefore, less demand for indirect access wholesale services. This would have repercussions on the profits for the operator providing such services, possibly making an increase in wholesale prices not profitable, although this would also depend on the balance between the integrated wholesale suppliers overall wholesale/retail profits. This competitive situation is shown in the following illustration:

### Indirect price constraints



Although realistically it is much more complicated than illustrated above, the model shows that, under certain circumstances, a competitive retail market could conceivably discipline the behaviour of a monopoly in the upstream market. In that case, self-supply should be taken into account for wholesale market analysis<sup>61</sup>. The consequences of this decision could be that the market would be broader since mobile operators would

<sup>61</sup> For a more detailed analysis of this question refer to: BoR (10) 09 BEREC report on self supply.

be included in the market analysis. Under this scenario, effective competition would be more likely to be found, and no SMP operator identified<sup>62</sup>.

## 8. CONCLUSIONS

Trends in technology and increasing convergence of fixed and mobile services mean that FMS is likely to become a more relevant consideration in market definition for electronic communications services going forward.

Asymmetric substitution is a relevant factor to consider in FMS mainly due to the mobility feature of the mobile services. Defining the focal product and analysing the reasons causing asymmetric substitution can be important not only in the analysis of FMS but also for market definition in general.

We have already seen one case (Austria) where fixed and mobile services were included within the same market. The available data tends to show that FMS is generally increasing – particularly for voice calls. NRAs use many complementary sources of information and types of analysis to decide if mobile and fixed services should be included in the same market.

However, the picture of FMS across countries is highly heterogeneous and depends on factors which vary at a national level. NRAs are likely to need to take into account different factors in assessing FMS, and some factors will be more important for some countries than others.

Where FMS is considered significant enough to include fixed and mobile services in the same market it is possible that the market power of the fixed incumbent operator is reduced and this is likely to have implications for the competition assessment.

Even where FMS is not sufficient to define a single market including fixed and mobile, it may be the case that FMS provides a degree of price constraint which should be considered in the three criteria test for imposing ex-ante regulation assessment, in the SMP assessment and, in the event that SMP is found, it may be considered in deciding the appropriate ex ante obligations to impose.

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<sup>62</sup> However, it is also necessary to consider any links the fixed operator has with the mobile market (e.g. does it have a mobile operation).

## ANNEX 1 – ADDITIONAL TABLES (SECTION 3)

### FMS –Voice services

- a- Countries with low and decreasing fixed line penetration, and increasing number of mobile only households

Examples:

	Fixed line penetration		Mobile only households	
	Q1 2011	Comparison with Q4 2009	Q1 2011	Comparison with Q4 2009
Czech Republic	17%	-8%	81%	+8%
Finland	20%	-8%	78%	+7%

*Source: E-communications household survey (2011)*

- b- Countries with high and steady (or growing) fixed line penetration, and a large majority of dual accesses (both fixed and mobile) households.

Examples:

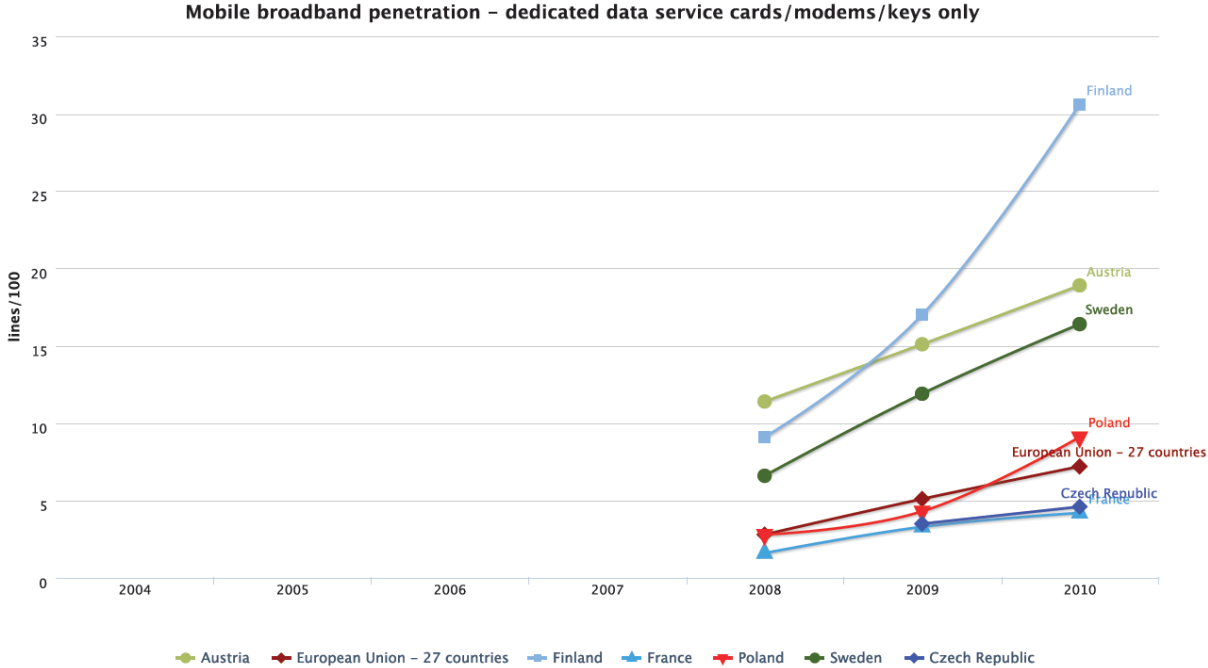
	Fixed line penetration		Dual accesses households	
	Q1 2011	Comparison with Q4 2009	Q1 2011	Comparison with Q4 2009
France	87%	-1%	76%	=
The Netherlands	89%	+1%	85%	+2%

*Source: E-communications household survey (2011)*

### FMS – Data services

Use of the mobile phone network to access the internet (Q1 2011)	
Finland	29%
Austria	20%
Sweden	19%
Poland	14%
Czech Republic	6%
The Netherlands	4%

*Source – E-communication household survey (2011)*



Source – European Commission, Digital agenda scoreboard

## ANNEX 2 – FIRST ANALYSIS (SECTION 3)

Section 3.1 of the report (*substitution of fixed voice services by mobile voice services*) introduced a first overview of possible fixed-mobile substitution trends in Europe for voice services.

Based on the quantitative data analysed in section 3, we can highlight the important parameters that may influence the trend in fixed to mobile substitution. These parameters are discussed in more depth in section 6 of this report.

### SUBSTITUTION OF FIXED VOICE SERVICES BY MOBILE VOICE SERVICES

#### Price

Price of voice access and calls is obviously an important parameter that may enable or hinder fixed to mobile substitution.

##### *Mobile prices*

Focusing on the affordability of mobile telephony, the results of the 2011 E-communications households survey emphasize that 65% of EU mobile phone users are concerned about mobile communication charges and consequently limit their calls. This might limit the trend toward fixed-mobile substitution for calls and, possibly, for voice access.

Nonetheless, this parameter does not seem to be directly correlated with fixed to mobile voice access substitution. Indeed, this concern is most important in Greece and Spain and is also important in the Czech Republic (77%; +7%). As discussed in section 4, a trend toward fixed to mobile voice access substitution appears to be more likely in the Czech Republic.

##### *Fixed prices*

Based on the 2010 E-Communication Households Survey, cost is the second reason why households don't have fixed telephone lines at home (37%). In its analysis on Mobile-only households<sup>63</sup>, Analysys Mason points out the significance of price as a parameter which can influence fixed to mobile substitution: *"In Western Europe, fixed voice is cheaper than mobile. The average retail price per minute on fixed networks (including revenue from line rental) was 37% lower than the same on mobile networks*

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<sup>63</sup> Source : Analysis Mason (*Mobile-only households: fixed voice will all but disappear in some Central and Eastern European countries*) – September 2011

[http://www.analysismason.com/About-Us/News/Insight/Insight\\_fixedvoice\\_abandonment\\_CEE\\_Sep2011/?utm\\_campaign=Insight%2029%20September%2011&utm\\_source=emailCampaign&utm\\_medium=email](http://www.analysismason.com/About-Us/News/Insight/Insight_fixedvoice_abandonment_CEE_Sep2011/?utm_campaign=Insight%2029%20September%2011&utm_source=emailCampaign&utm_medium=email)

*at 2Q 2011. Western European fixed operators can use relatively cheap prices to keep customers, in a way CEE<sup>64</sup> fixed operators cannot. Because the mobile market in CEE is more competitive than the fixed market, mobile voice is cheaper (by 63%, excluding Russia, at 2Q 2011)."*

## **Bundles**

Service packages (bundles) may influence significantly the trend towards fixed to mobile substitution.

Bundles are becoming more and more popular among EU citizens (four out of ten EU households are buying bundles of communication services from a single provider – 42%; +4%<sup>65</sup>) and internet access and fixed telephony are the most common items in a package (respectively 90% and 82% of subscribed bundles include them). Fixed telephony services are now bought as part of a service package in 48% of the cases (42% in Q4 2009)<sup>66</sup>. This means giving up fixed access and substituting it with mobile access may have more significant implications. Due to the uptake of bundled packages, fixed operators can get stronger loyalty from their customers. Bundles are thus important parameters that need to be considered in a FMS.

There appears to be a correlation between the penetration of bundles and fixed mobile substitution patterns. Countries such as Finland (14%) or the Czech Republic (19%) that exhibit an increasing number of mobile only households have the lowest rate of bundle penetration. Countries such as Sweden (50%), the Netherlands (67%) and France (55%) that exhibit high and steady rates of fixed access penetration also have higher rates of bundles penetration.

The development of quadruple play bundles (TV, fixed telephony, mobile telephony, Internet access) in certain countries tends to show that mobile and fixed telephony services are regarded (or at least offered) as complements and not substitutes. Quadruple play bundles are not popular at the European level (2% in Q1 2011 according to the E-communication household survey).

## **SUBSTITUTION OF FIXED DATA SERVICES BY MOBILE DATA SERVICES**

### **Price**

As for voice, prices (including subscription schemes) may influence the trend toward fixed to mobile substitution. The 2010 E-communications household survey points out

<sup>64</sup> CEE: Central and Eastern European Countries

<sup>65</sup> E-communications Households Survey (2011)

<sup>66</sup> Source: E-communications Households Survey (2011)

for instance that 32% of the persons having a mobile phone with access to the Internet consider that the accessibility to online content is constrained by the subscription scheme that was contracted. In 2011, the survey points out consistently that “*Half of those with mobile Internet access limit their use of it because of concern about the cost.*” Concern is greatest in Belgium, Spain and Bulgaria where almost two thirds of respondents feel this way (65%, 65% and 64% respectively). Such a concern is less important (41%) in Austria where fixed to mobile substitution of data services is already observed on the retail market.

Consequently, the price/subscription scheme of a service should be considered when assessing fixed to mobile substitution of data services.

### **Bundles**

As pointed out for voice services, bundled packages (especially popular for fixed line access) help fixed operators to obtain stronger levels of loyalty from their customers.

### ANNEX 3 - QUESTIONNAIRE

#### QUESTIONNAIRE - IMPACT OF FIXED-MOBILE SUBSTITUTION IN MARKET DEFINITION CONVERGENCE AND ECONOMIC ANALYSIS GROUP

This questionnaire intends to gather information about the situation regarding fixed-mobile substitution in market definition in the EEA Member States. The questions will be mainly focused in the market analysis process trying to understand: (1) if and how the NRAs have been analysing the possibility of fixed and mobile services belonging to the same relevant market; (2) the information taken into account in this substitutability analysis; and (3) the NRA's conclusions regarding this possibility. The first section of the questionnaire will also ask some basic information about the penetration of fixed and mobile services just to frame the market situation faced by your NRA regarding fixed mobile substitution.

#### Contact details:

NRA:	Name:
E-mail:	Telephone number:

#### Section 1. Background & Market Information

		2008 <sup>67</sup>	2009 <sup>1</sup>	2010 <sup>1</sup>	Last Available
% of households that	only have <b>fixed broadband (BB)</b> services:				
	only have <b>mobile BB</b> services:				
	have <b>mobile &amp; fixed BB</b> services:				
	don't have <b>mobile &amp; fixed BB</b> services:				
% of households that	only have <b>fixed voice</b> services:				
	only have <b>mobile voice</b> services:				
	have <b>mobile &amp; fixed voice</b> services:				
	don't have <b>mobile &amp; fixed voice</b> services:				
Number of broadband accesses	supported in <b>fixed networks</b> :				
	supported in <b>mobile networks</b> <sup>68</sup> :				
	supported in <b>mobile networks</b> <sup>2,69</sup> :				
Number of voice accesses	supported in <b>fixed networks</b> <sup>70</sup> :				
	supported in <b>mobile networks</b> :				
Broadband traffic (per access, in GB)	in <b>fixed networks</b> :				
	in <b>mobile networks</b> <sup>2</sup> :				
	in <b>mobile networks</b> <sup>2,3</sup> :				
Overall voice traffic <sup>71</sup> (minutes per access)	in <b>fixed networks</b> :				
	In <b>mobile networks</b> :				
Overall voice traffic <sup>b</sup> (calls per access)	in <b>fixed networks</b> :				
	In <b>mobile networks</b> :				

1. Within market analysis did you ever analyse the integration of mobile and fixed services in the same market (we are interested in retail and wholesale markets)<sup>72</sup>?

Yes  No  If you have answered NO you can go to Section 4 of this questionnaire.

#### 2. IF YES:

In which markets (we are interested in retail and wholesale markets)<sup>6</sup>? Retail:      Wholesale:

<sup>67</sup> At the end of the year.

<sup>68</sup> All active users – "Actual usage is defined as a transaction, which has been made in the last 90 days (before end of period), whereby a user accessed advanced data services such as web/internet content, online multiplayer gaming content, VoD or other equivalent advanced data services (excluding SMS and MMS). The definition provides a number of active users involved in transactions".

<sup>69</sup> Dedicated data service cards/modems/keys only.

<sup>70</sup> Active fixed telephone lines.

<sup>71</sup> Originating calls.

<sup>72</sup> Please consider that we are interested in all the markets you have analyzed independently if they are at the retail or wholesale level or if they are listed or not in the Commission's Recommendation(s) on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation. Notwithstanding, we have a special interest in the markets related with voice and broadband services.



3. In which of these markets have you concluded that the mobile and fixed services belonged to the same relevant market (we are interested in retail and wholesale markets)<sup>6</sup>? Retail:      Wholesale:

4. What were the main reasons considered in order to conclude for the (non) existence of substitutability in the markets mentioned above? Retail:      Wholesale:

5. Even if you never concluded that mobile and fixed services belong to the same relevant market did the existence of substitution between mobile and fixed services ever influenced your conclusions regarding SMP analysis or the imposition of obligations in the markets? In which markets<sup>6</sup>? In which way?

### Section 2. Substitutability analysis

What type of analysis did you perform when analysed the possible integration of fixed and mobile services under the same wholesale/retail market?

Qualitative analysis <input type="checkbox"/>	Econometric analysis <input type="checkbox"/>
Survey <input type="checkbox"/>	Experimental economics <input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

Comments and other analysis performed:

### Section 3. Information sources

What information sources did you consider when analysed the possible integration of fixed and mobile services under the same wholesale/retail market?

Information from the historic/SMP operator <input type="checkbox"/>	Information from the alternative operators <input type="checkbox"/>
Specific Survey <input type="checkbox"/>	Available surveys <input type="checkbox"/>
Public available information <input type="checkbox"/>	Information from other market agents <input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

Comments and other information sources considered:

### Section 4. Information used and relevance

This section contains 11 tables. The first line of each table (in blue) refers to generic information about the issue included in the table. The other lines of the tables refer to more specific and detailed information related with the generic issue that can be taken into account in the substitutability analysis. It is essential for our work that we have information at least about the 11 generic lines but it would be great if you could provide a more detailed answer.

The tables refer to information that might be used in the substitutability analysis of fixed and mobile **retail** services. We ask if your NRA considers the information relevant and if the information has already been used in the analysis of the possible integration of fixed and mobile services under the same **retail market**. At the end of this section we ask you about the differences between the information and type of analysis used at the retail level and at the wholesale level.

If you have never analysed the possible integration of mobile and fixed services in the same retail market you can still choose the relevance of the information for a possible substitutability analysis.

**Please in choose the right option in each column.**

**When choosing the relevance of the information the options are:**

**0 –Non applicable**

**1 –Relevant to assess substitutability between fixed & mobile services but not key parameter within national context**

**2 –Relevant to assess substitutability between fixed & mobile e services and key parameter within national context**

#### 1. Difference in offer characteristics between fixed & mobile services (Current & Evolution)

Information	Relevance for		Already used in retail market definition?	
	Broadband	Voice	BB	Voice
<b>Difference in offer characteristics between fixed and mobile services</b>	<b>Choose</b>	<b>Choose</b>	<b>Choose</b>	<b>Choose</b>
Price (Level)	Choose	Choose	Choose	Choose
Price Structure <sup>73</sup>	Choose	Choose	Choose	Choose
Downstream bandwidth	Choose		Choose	
Upstream bandwidth	Choose		Choose	
Usage limitation (Mb/minutes)	Choose	Choose	Choose	Choose
Limitation in the use of applications (e.g. Skype)	Choose		Choose	
Inclusion of "free" fixed minutes per month in the offer	Choose	Choose	Choose	Choose
Inclusion of "free" mobile minutes per month in the offer	Choose	Choose	Choose	Choose

Comments and additional information:

<sup>73</sup>Differences in price plan structure: by these we mean differences within the structure of fixed and mobile price plans (e.g. for voice services: the existence of a monthly fee versus a compulsory top-up, differences in on-net and off-net per minute prices, etc).

## 2. Market Structure & Strategy

Information	Relevance for		Already used in retail market definition?	
	Broadband	Voice	BB	Voice
<b>Market Structure &amp; Strategy</b>	Choose	Choose	Choose	Choose
Do the major mobile and fixed operators belong to the same group or have any kind of agreements?	Choose	Choose	Choose	Choose
Competition level in the fixed/mobile services segment	Choose	Choose	Choose	Choose
Existence of an aggressive strategy of mobile/fixed operator to gain critical mass in the market?	Choose	Choose	Choose	Choose
Comments and additional information:				

## 3. Analysis of bundled offers

Information	Relevance for		Already used in retail market definition?	
	Broadband	Voice	BB	Voice
<b>Analysis of bundled offers</b>	Choose	Choose	Choose	Choose
Penetration of single and bundled offers (all options)	Choose	Choose	Choose	Choose
Penetration and conditions of bundled offers including fixed and mobile services simultaneously	Choose	Choose	Choose	Choose
Existence/Penetration of quadruple play offers or offers that mix fixed and mobile access	Choose	Choose	Choose	Choose
Comments and additional information:				

## 4. Comparison of the Number of accesses/Penetration Evolution

Information	Relevance for		Already used in retail market definition	
	Broadband	Voice	BB	Voice
<b>Comparison of Number of accesses/Penetration Evolution</b>	Choose	Choose	Choose	Choose
Comparison of the evolution of the number of accesses/penetration for mobile and fixed accesses	Choose	Choose	Choose	Choose
% of houses that only have fixed service	Choose	Choose	Choose	Choose
% of houses that only have mobile service	Choose	Choose	Choose	Choose
% of houses that have both mobile and fixed services	Choose	Choose	Choose	Choose
Comments and additional information:				

## 5. Evaluation of the possible use of television like services in mobile networks

Information	Relevance for		Already used in retail market definition?	
	Broadband	Voice	BB	Voice
<b>Evaluation of the possible use of television like services in mobile networks</b>	Choose	Choose	Choose	Choose
Availability of applications & services allowing TV (or similar) in mobile networks?	Choose	Choose	Choose	Choose
Penetration of bundles integrating TV services in fixed and mobile networks	Choose	Choose	Choose	Choose
Penetration of TV service as a single offer	Choose	Choose	Choose	Choose
Comments and additional information:				

### 6. Historic & Potential substitutability between fixed and mobile services

Information	Relevance for		Already used in retail market definition?	
	Broadband	Voice	BB	Voice
<b>Historic &amp; Potential substitutability between fixed and mobile services</b>	Choose	Choose	Choose	Choose
Historic data about switch between mobile & fixed services	Choose	Choose	Choose	Choose
Reasons for past switch between fixed & mobile services	Choose	Choose	Choose	Choose
Data about the intention or possibility of switch between mobile and fixed services (if the fixed prices go up by 5/10% would you change to mobile services?)	Choose	Choose	Choose	Choose
Reasons for end users to switch from fixed service to mobile service? And vice versa	Choose	Choose	Choose	Choose
Barriers to switch between fixed and mobile services and vice versa	Choose	Choose	Choose	Choose
Comparison of contract duration between fixed and mobile services	Choose	Choose	Choose	Choose
Comments and additional information:				

### 7. Terminal equipments differences

Information	Relevance for		Already used in retail market definition	
	Broadband	Voice	BB	Voice
<b>Terminal equipments differences</b>	Choose	Choose	Choose	Choose
Difference of prices of terminal equipments for mobile services and the terminal equipments for fixed services	Choose	Choose	Choose	Choose
Existence of offers that bundle the necessary terminal equipments	Choose	Choose	Choose	Choose
Percentage of houses with multiple computers	Choose		Choose	
Differences in characteristics of the terminal equipment <sup>74</sup>	Choose	Choose	Choose	Choose
Comments and additional information:				

### 8. Differences in end user's characteristics or service usage

Information	Relevance for		Already used in retail market definition?	
	Broadband	Voice	BB	Voice
<b>Differences end user's characteristics or service usage</b>	Choose	Choose	Choose	Choose
Differences in consumption pattern between fixed users and mobile users (e.g. usage frequency, duration)	Choose	Choose	Choose	Choose
Differences in the use of the access for the end user (e.g. for broadband: e-mails, homebanking, P2P, Youtube, etc)	Choose	Choose	Choose	Choose
Differences in end user characteristics (e.g. income, education, age, etc) of mobile services versus fixed services	Choose	Choose	Choose	Choose
Differences in security while using some applications between mobile and fixed services (e.g. homebanking)	Choose	Choose	Choose	Choose
Comments and additional information:				

<sup>74</sup>E.g., differences in the size of the screen, differences in the size of the keypad, etc.

### 9. Existence of promotion programmes for specific networks/services

Information	Relevance for		Already used in retail market definition?	
	Broadband	Voice	BB	Voice
<b>Existence of promotion programmes for specific networks /services<sup>75</sup></b>	Choose	Choose	Choose	Choose
Existence of specific programmes promoting the use of mobile or fixed services	Choose	Choose	Choose	Choose
Relation between adoption of the use of mobile/fixed service and the existence of the promotion programme	Choose	Choose	Choose	Choose
Comments and additional information:				

### 10. Specific Supply issues

Information	Relevance for		Already used in retail market definition?	
	Broadband	Voice	BB	Voice
<b>Specific Supply issues</b>	Choose	Choose	Choose	Choose
Level of cost differences between mobile and fixed services	Choose	Choose	Choose	Choose
Capacity differences between fixed and mobile networks	Choose	Choose	Choose	Choose
Operators investment plans	Choose	Choose	Choose	Choose
LTE availability	Choose	Choose	Choose	Choose
NGA products availability (e.g. 100 Mbps offers)	Choose	Choose	Choose	Choose
Differences in network coverage	Choose	Choose	Choose	Choose
Geographic differences in bandwidth of mobile & fixed networks	Choose	Choose	Choose	Choose
Comments and additional information:				

### 11. End user satisfaction

Information	Relevance for		Already used in retail market definition?	
	Broadband	Voice	BB	Voice
<b>End user satisfaction</b>	Choose	Choose	Choose	Choose
Level of satisfaction with the mobile/fixed service	Choose	Choose	Choose	Choose
Level of dissatisfaction with the mobile/fixed service	Choose	Choose	Choose	Choose
Differences on the perceived quality of service between fixed and mobile services	Choose	Choose	Choose	Choose
Main reasons to satisfaction with the mobile/fixed service	Choose	Choose	Choose	Choose
Main reasons to dissatisfaction with the mobile/fixed service	Choose	Choose	Choose	Choose
Comments and additional information:				

1. Additional general information to consider in substitutability analysis between mobile and fixed services in **retail voice** markets:

2. Additional general information to consider in substitutability analysis between mobile and fixed services in **retail broadband** markets:

3. What are the main differences between analysing the substitutability in **retail markets** between mobile and fixed services for voice and broadband?

4. General information to consider in substitutability analysis between mobile and fixed services in **wholesale voice markets** (if relevant specify which wholesale markets you consider):

5. General information to consider in substitutability analysis between mobile and fixed services in **wholesale broadband** markets (if relevant *specify which wholesale markets you consider*):

6. What are the main **differences** between analysing the substitutability between mobile and fixed services at the **retail and wholesale** level?

**THANK YOU FOR YOUR HELP!**

<sup>75</sup> We are referring to third party promotion programs (e.g. governments promoting the use of mobile broadband).

## ANNEX 4 - ANSWERS TO THE QUESTIONNAIRE

### Section 1 - Background and market information

Question 1: Within market analysis did you ever analyse the integration of mobile and fixed services in the same market?

Number of NRAs responding YES	Number of NRAs responding NO
22	3 <sup>76</sup>

### Section 2 – Substitutability analysis

What type of analysis did you perform when you analysed the possible integration of fixed and mobile services under the same wholesale/retail market?

OPTION	Number of NRAs choosing this option
Qualitative analysis	22
Survey	18
Econometric analysis	5
Quantitative analysis	5
Experimental economics	1

### Section 3 – Information sources

What information sources did you consider when analysed the possible integration of fixed and mobile services under the same wholesale/retail market?

OPTION	Number of NRAs choosing this option
Information from the historic/SMP Operator	20
Information from the alternative operators	19
Public available information	19
Available surveys	15
Specific survey	14
Information from other market agents	6
Information from other NRAs	2

### Section 4 – Information used and relevance

NRAs were asked to rate whether each type of information was:

- Not applicable;
- Relevant to assess FMS **but not** a key parameter in the national context; or
- Relevant to assess FMS **and** a key parameter in the national context.

NRAs were also asked to indicate if they have already used each type of information in retail market definition<sup>77</sup>.

<sup>76</sup> One of the NRAs responding to the questionnaire mentioned that it does not perform market analysis

**Table 1. Difference in offer characteristics between fixed and mobile services**

Characteristic	Broadband - number of NRAs responding to each category			Voice - number of NRAs responding to each category			Already used in retail market definition?	
	Option 0	Option 1	Option 2	Option 0	Option 1	Option 2	BB	Voice
<b>Difference in offer characteristics between fixed and mobile services</b>	1	2	19	1	4	17	19	19
Price (Level)	0	1	22	0	1	22	18	18
Price Structure	0	9	13	1	6	15	14	15
Downstream bandwidth	0	2	20	N.A.	N.A.	N.A.	17	N.A.
Upstream bandwidth	2	11	9	N.A.	N.A.	N.A.	13	N.A.
Usage limitation (Mb/minutes)	0	8	15	9	9	4	15	3
Limitation in the use of applications (e.g. Skype)	6	14	3	N.A.	N.A.	N.A.	4	N.A.
Inclusion of "free" fixed minutes per month in the offer	15	5	1	6	11	5	0	6
Inclusion of "free" mobile minutes per month in the offer	14	5	1	5	12	6	1	7

**Table 2. Market Structure & Strategy**

Characteristic	Broadband - number of NRAs responding to each category			Voice - number of NRAs responding to each category			Already used in retail market definition?	
	Option 0	Option 1	Option 2	Option 0	Option 1	Option 2	BB	Voice
<b>Market structure &amp; Strategy</b>	2	13	9	2	13	9	11	7
Do the major mobile and fixed operators belong to the same group or have any kind of agreement?	2	11	7	3	12	6	9	5
Competition level in the fixed/mobile services segment	2	9	10	2	8	9	6	7
Existence of an aggressive strategy of mobile/fixed operator to gain critical mass in the market	5	12	4	4	10	6	6	4

<sup>77</sup> Some NRAs may consider the information relevant or even relevant and key parameter but not have used the information in the market analysis because when the market analysis was performed the information was not available or at that time it was not relevant for the analysis.

**Table 3. Analysis of bundled offers**

Characteristic	Broadband - number of NRAs responding to each category			Voice - number of NRAs responding to each category			Already used in retail market definition?	
	Option 0	Option 1	Option 2	Option 0	Option 1	Option 2	BB	Voice
<b>Analysis of bundled offers</b>	3	13	8	4	10	9	11	7
Penetration of single and bundled offers (all options)	1	12	6	2	9	9	7	6
Penetration and conditions of bundled offers including fixed and mobile services simultaneously	1	13	5	2	10	8	7	5
Existence/Penetration of quadruple play offers or offers that mix fixed and mobile access	2	15	2	3	12	4	5	3

**Table 4. Comparison of the number of accesses**

Characteristic	Broadband - number of NRAs responding to each category			Voice - number of NRAs responding to each category			Already used in retail market definition?	
	Option 0	Option 1	Option 2	Option 0	Option 1	Option 2	BB	Voice
<b>Comparison of Number of accesses/Penetration Evolution</b>	1	7	15	1	7	15	16	17
Comparison of the evolution of the number of accesses	1	5	16	1	7	15	15	15
% of households that only have fixed service	1	8	13	1	7	15	7	11
% of households that only have mobile service	0	9	13	1	8	14	8	11
% of households that have both mobile and fixed services	1	6	15	1	8	14	8	10

**Table 5. Evaluation of the possible use of television like services in mobile networks**

Characteristic	Broadband - number of NRAs responding to each category			Voice - number of NRAs responding to each category			Already used in retail market definition?	
	Option 0	Option 1	Option 2	Option 0	Option 1	Option 2	BB	Voice
<b>Evaluation of the possible use of television like services in mobile networks</b>	7	11	5	13	9	0	6	3
Availability of applications & services allowing TV (or similar) in mobile networks?	7	11	3	11	6	2	4	1
Penetration of bundles integrating TV services in fixed and mobile networks	5	8	7	8	9	2	7	4
Penetration of TV service as a single offer	8	10	2	11	8	0	4	1

**Table 6. Historic and potential substitutability between fixed and mobile services**

Characteristic	Broadband - number of NRAs responding to each category			Voice - number of NRAs responding to each category			Already used in retail market definition?	
	Option 0	Option 1	Option 2	Option 0	Option 1	Option 2	BB	Voice
<b>Historic &amp; Potential substitutability between fixed and mobile services</b>	1	6	15	1	6	16	11	13
Historic data about switching between mobile & fixed services	3	7	12	2	10	11	10	12
Reasons for past switching between fixed & mobile services	4	9	9	3	10	11	8	10
Data about the possibility of switching between mobile and fixed services in response to a price increase	2	4	15	1	4	17	11	12
Reasons for end users to switch from fixed service to mobile service? And vice versa	3	6	12	2	7	13	8	11
Barriers to switching between fixed and mobile services and vice versa	1	9	11	1	9	12	10	13
Comparison of contract duration between fixed and mobile services	5	13	3	7	10	4	4	4



**Table 7. Terminal equipments differences**

Characteristic	Broadband - number of NRAs responding to each category			Voice - number of NRAs responding to each category			Already used in retail market definition?	
	Option 0	Option 1	Option 2	Option 0	Option 1	Option 2	BB	Voice
<b>Terminal equipments differences</b>	5	11	5	5	12	5	5	5
Difference of prices of terminal equipments for mobile services and the terminal equipments for fixed services	4	12	5	6	12	3	4	3
Existence of offers that bundle the necessary terminal equipments	3	14	3	6	13	2	5	3
Percentage of houses with multiple computers	11	7	1	N.A.	N.A.	N.A.	4	
Differences in characteristics of the terminal equipment <sup>78</sup>	6	9	6	6	12	4	7	7

**Table 8. Differences in end user characteristics or service usage**

Characteristic	Broadband - number of NRAs responding to each category			Voice - number of NRAs responding to each category			Already used in retail market definition?	
	Option 0	Option 1	Option 2	Option 0	Option 1	Option 2	BB	Voice
<b>Differences in end user's characteristics or service usage</b>	2	13	7	2	11	10	12	13
Differences in consumption pattern between fixed users and mobile users	3	10	9	2	10	10	11	12
Differences in the use of the access for the end user	4	8	10	9	6	7	10	7
Differences in end user characteristics of mobile services versus fixed services	9	10	2	8	11	4	6	7
Differences in security while using some applications between mobile and fixed services	8	11	1	10	8	2	4	3

<sup>78</sup> E.g., differences in the size of the screen, differences in the size of the keypad, etc.

Table 9. End user satisfaction

Characteristic	Broadband - number of NRAs responding to each category			Voice - number of NRAs responding to each category			Already used in market definition?	
	Option 0	Option 1	Option 2	Option 0	Option 1	Option 2	BB	Voice
<b>End user satisfaction</b>	3	14	5	4	12	4	8	4
Level of satisfaction with mobile/fixed service	3	12	5	4	10	5	6	2
Level of dissatisfaction with the mobile/fixed service	4	14	2	4	12	3	6	1
Differences in perceived quality of service between fixed and mobile	3	11	6	2	9	8	6	4
Main reasons for satisfaction with the mobile/fixed service	6	10	4	5	10	4	6	3
Main reasons for dissatisfaction with the mobile/fixed service	5	11	4	4	11	4	6	3

Table 10. Existence of promotion programmes for specific networks/services

Characteristic	Broadband - number of NRAs responding to each category			Voice - number of NRAs responding to each category			Already used in retail market definition?	
	Option 0	Option 1	Option 2	Option 0	Option 1	Option 2	BB	Voice
<b>Existence of promotion programmes for specific networks/services</b>	12	8	3	14	7	1	4	1
Existence of specific programmes promoting the use of mobile or fixed services	9	7	3	10	7	1	3	0
Relation between adoption of the use of mobile/fixed service and the existence of the promotion programme	11	7	1	12	6	0	2	0

Table 11. Specific Supply issues

Characteristic	Broadband - number of NRAs responding to each category			Voice - number of NRAs responding to each category			Already used in retail market definition?	
	Option 0	Option 1	Option 2	Option 0	Option 1	Option 2	BB	Voice
<b>Specific Supply issues</b>	0	8	13	2	8	12	14	11
Level of cost differences between mobile and fixed services	2	8	12	2	8	9	12	7
Capacity differences between fixed and mobile networks	0	11	12	5	10	5	14	4
Operators investment plans	3	15	4	5	11	3	8	5
LTE availability	4	12	6	9	7	3	6	2
NGA products availability (e.g. 100 Mbps offers)	4	9	8	9	7	3	7	3
Differences in network coverage	1	9	12	2	10	8	12	7
Geographic differences in bandwidth of mobile & fixed networks	2	11	11	10	6	5	10	2