Geographic Segmentation of Broadband Markets: Appropriate Differentiation or Risk to a Single EU Market?

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Abstract: Until recently, wholesale broadband markets have usually been considered to have a national scope, with some exceptions associated with the existence of different incumbent fixed operators in different geographic areas, like the Hull area in the UK. The development of local loop unbundling and the deployment of alternative infrastructures to provide telecommunication services, such as cable, have changed the competitive landscape in certain areas. This has resulted in a higher degree of heterogeneity in the competitive conditions observed in wholesale broadband markets across geographic areas, which has led some regulators, like Ofcom and ANACOM, to define sub-national geographic markets, imposing obligations only in those markets were significant market power operators have been identified. In other cases, like in Austria, the regulator has opted for defining a single national market but imposing differentiated remedies to take account of the heterogeneity in the competitive conditions observed in different geographic areas. Based upon this recent experience in the context of wholesale broadband markets, this paper aims to provide insights on the main issues associated with the implementation of the analysis of geographic markets and its consistency with the European Commission's objective of developing a single EU telecommunications market.

Key words: geographic markets, Next Generation Networks, market definition, remedies.

There is significant variation in the competitive conditions emerging in fixed broadband markets in different types of geographic areas across different European countries. As such, in some countries the market share of the incumbent operator in the retail broadband market ranges from nearly 100% in some areas to less than 25% in other areas of the country. [1] This trend appears to be driven by two main factors:

(*) The views expressed in this article do not represent the position of Frontier Economics, but only the authors' personal standpoints. We are grateful, for their helpful comments, to three anonymous referees and Damien Geradin.

[1] See Figure A11.4 of Ofcom, 2010.

- The development of local loop unbundling (LLU), which has facilitated competition in the retail and wholesale broadband access markets in the areas covered by the exchanges where LLU operators have established their presence, and

- Heterogeneity in the 'profitability' of different geographic areas, driven by the underlying supply and demand characteristics. In particular, the deployment of some infrastructures, like cable and fibre, has typically focused in high density and urban areas.

This trend is likely to continue with the development of super-fast broadband (SFBB) as the investment required to provide SFBB services is likely to be profitable, in certain areas where operators can benefit from economies of scale and scope.

Some National Regulatory Authorities (NRAs) have already taken this reality into account in recent market reviews, by examining in more depth the geographic scope of the markets for wholesale broadband access (WBA) and wholesale local access (WLA). Hence, in contrast to the first round of market reviews between 2003 and 2006, in the second and third rounds of market analyses a number of NRAs have defined sub-national WBA geographic markets on the basis of distinct competitive conditions observed in different areas of the country (UK and Portugal). In other cases, like Austria and recently Poland, having defined a national relevant (geographic) WBA market, the NRA has applied different remedies in different geographic areas based on the different competitive conditions observed. More recently, the French Competition Authority has invited the regulator (ARCEP) to lighten the regulation imposed on France Telecom in the wholesale broadband market in those areas of the country where competition has developed. [2]

This recent experience suggests a few points.

- First, the definition of geographic markets needs to be adapted to the specific circumstances of the country. Both the geographic unit used in the analysis and the criteria to group the different geographic units will depend on the source of the competitive restrictions faced by the incumbent operator. Where LLU operators are the main restriction, the local exchange

[2] See http://www.arcep.fr/index.php?id=8571&L=1&tx_gsactualite_pi1[uid]=1365&tx_gsactualite_pi1[annee]=&tx_gsactualite_pi1[theme]=&tx_gsactualite_pi1[motscle]=&tx_gsactualite_pi1[backID]=26&cHash=dba5f85bb0 and http://www.autoritedelaconcurrence.fr/user/standard.php?id_rub=389&id_article=1561

area of the copper network looks an adequate candidate, as in the case of the UK. If the main source of competition is given by alternative infrastructure operators, such as cable, then a different geographic unit, reflecting the entry model of alternative operators, may be more appropriate.

- Second, the main competitive restriction in the WBA market often comes from vertically integrated operators providing broadband services at retail level. The analysis of indirect constraints plays therefore a key role in the geographic segmentation of WBA markets.
- Third, the threshold between sub-national geographically segmented regulation and differentiated remedies within a national market is not clear cut (OECD, 2010). There is still a high level of uncertainty on the conditions under which, in a context where competitive conditions seem to differ across areas, the definition of sub-national markets is more appropriate than the adoption of differentiated remedies within a single national market.

Based upon the experience of geographic market analysis in the context of WBA markets, this paper aims to provide insights on the main issues associated with the implementation of the analysis of geographic markets. We also consider the implications for regulators and operators associated with the introduction of geographically differentiated remedies, assessing its potential costs (due to the higher complexity of regulation and the potential for divergence between member states in terms of regulatory approach) and benefits (as the regulation is more appropriate in the sense of being adapted to the specific conditions of competition in the different areas).

■ Does geographic market segmentation affect the idea of a single European Telecommunications market?

Since the beginning of EU's telecommunications regulation, measures have been devised as vehicles to achieve the overall objective of establishing a single European market for telecommunications to enhance the movement of products, services and human/physical capital within the EU. In consequence, the European Commission (the Commission hereafter) has established subsequent regulations aimed at progressively removing any regulatory and/or legal barriers towards an internal market, such as the abolition of special rights of certain public enterprises to produce/supply services [3] or the introduction of technical harmonisation measures in the radio spectrum policy field. [4]

The Commission's goal became even clearer in 2002, with the introduction of the EU Regulatory Framework for telecommunications that was first implemented in July 2003. This new set of measures presented mechanisms aimed at ensuring regulatory consistency in order to consolidate an internal market, simplifying the regulatory framework. This was achieved through both competition oriented and consumer focused regulation. Key elements of these measures included:

- the definition of a list of 18 communications markets, where competition could be expected not to operate effectively, with all EU member state NRAs being required to analyse the competitive conditions in these markets,
- where an NRA found one (or more) operators holding a position of significant market power (SMP) in these markets, to impose *ex ante* regulatory remedies that would prevent the abuse of such position, and
- such remedies to be chosen from a pre-defined list, to ensure, to the extent possible, that there was a consistency in the obligations that SMP operators would face in different Member States.

The adoption of an updated framework in 2009 retained the key principles of the original set of measures. Furthermore, it sought to strengthen the support of an internal market by implementing measures that aimed, not only to protect consumers, but also to ensure further consistency in the regulatory measures and their application across Member States. For example, the new rules introduce the right for customers to switch telecom operators in just one day, and an obligation on operators to offer 12 month contracts. In order to ensure a more consistent application of regulation across the EU, the Commission has also been granted extra powers of oversight regarding the remedies adopted by NRAs. The Commission has worked closely with Member States to seek swift implementation of these new EU rules, considering the launch of infringement proceedings against Member States which have not implemented them in time. [5]

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[3] Commission Directive of 28 June 1990 on competition in the markets for telecommunications services (90/388/EEC).

[4] See http://ec.europa.eu/information_society/policy/ecomm/radio_spectrum/eu_policy/index_en.htm

[5] See http://europa.eu/rapid/pressReleasesAction.do?reference=IP/11/622&format=HTML&aged=0&language=EN&guiLanguage=en

The Commission's goal of creating a single market could, *a priori*, seem to be in potential conflict with geographic segmentation of markets, which could lead to a differentiation of regulatory obligations faced by SMP operators in different areas of the same Member State. The definition of local markets typically follows the approach considered in the European Regulatory Framework. [6] This requires imposing *ex ante* regulatory obligations only where there is no effective and sustainable competition and is explicitly recognized in paragraph (7) of Directive 2009/140/EC: [7]

> "In order to ensure a proportionate and adaptable approach to varying competitive conditions, national regulatory authorities should be able to define markets on a sub-national basis and to lift regulatory obligations in markets and/or geographic areas where there is effective infrastructure competition".

Hence, geographic segmentation, if properly analysed and justified, should not by itself imply inconsistencies in regulatory approaches. This however relies on a consistency in the approach taken by different NRAs to the issue of geographic segmentation, and remedies.

An illustration of the consistency of defining different markets in a country can be found in the UK. As stated in Ofcom's "Review of the wholesale broadband access markets" (Ofcom, 2008), taking into account the different competitive conditions one can determine 4 different geographic areas in the country. Hence, Ofcom defined 4 different WBA markets. One of the markets was assessed as competitive and no regulation was imposed in this market; regulatory obligations for the dominant operator were imposed in the rest of the markets.

Assuming a national approach was adopted instead, this would have forced Ofcom to define only one market for WBA. From there, if the incumbent was found to be dominant in the relevant market, if no geographic differentiation of remedies was possible, there would have to be a common remedy applied for the delivery of WBA services in all areas. This would have included regulating the provision of services in geographic areas that are considered competitive, which is not consistent, for example, with the

[6] Composed of the legal texts contained in EC (2010a).

[7] Directive 2009/140/EC of the European Parliament and of the Council of 25 November 2009 amending Directives 2002/21/EC on a common regulatory framework for electronic communications networks and services, 2002/19/EC on access to, and interconnection of, electronic communications networks and associated facilities, and 2002/20/EC on the authorisation of electronic communications networks and services.

approach in other Member States and/or markets, such as the retail market for fixed calls in the UK.

Further, removing regulation in WBA markets in those areas where LLU has become widespread and/or alternative infrastructures have been deployed is consistent with the "ladder of investment" theory, according to which access regulation should be adjusted over time in order to encourage competitors to progressively invest more deeply in the network (CAVE, 2007). Keeping WBA regulation in areas where alternative operators have 'stepped up the ladder', by moving from purchasing WBA products to investing in LLU, may not give the right signals to market participants.

The definition of different geographic markets does not appear by itself therefore to lead to an increased risk of inconsistency of the application of the EU regulatory framework, if the approach to the definition of local markets, and related remedies, is followed consistently by different NRAs. In this respect, defining local markets to reflect different competitive conditions does not appear to be any different to the approach for defining separate business and residential markets, which was the suggested segmentation in the Commission's first list of markets that would be susceptible to *ex ante* regulation. [8]

The application of a consistent approach to define local markets need not be synonymous with the application of a single approach: heterogeneous market characteristics across Member States may well require adaptation to local specificities. For example, in the UK WBA market, LLU operators were found to exert significant competitive pressure on the incumbent operator. In the case of Romania, the main constraint for the incumbent operator was found to be coming from non-DSL broadband technologies, with DSL based broadband provision representing 28% of the retail market. [9] The fact that the source of competitive pressure can come from different types of operators is likely to have consequences on the best approach to define geographic markets in each case. For example, whereas in the UK case the area covered by BT's local exchanges seems a good candidate for the geographic unit, this may not be appropriate in Romania, if the entry level of

[8] Commission Recommendation, of 11 February 2003. On relevant product and service markets within the electronic communications sector susceptible to *ex ante* regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communication networks and services (notified under document number C(2003) 497). (2003/311/EC).

[9] Information as of January 2010. Source Figure 93 of EC, 2010b.

alternative infrastructure operators is not necessarily overlapping significantly with the local exchange areas of Romtelecom (the incumbent fixed operator in Romania).

The economic principles underlying the geographic dimension of market definition in broadband markets

As starting point, it is useful to consider the economics of the geographic dimension of market definition for broadband services. A broadband customer will generally wish to have broadband access at a particular location – where they live or work. The purchasing decision is, therefore, likely to be local in nature. Provision of broadband to another location is not a reasonable substitute for broadband at the desired location.

Customers' choices between different suppliers therefore depend on the ability of broadband providers to provide services to that location. This depends on the network reach/coverage of the suppliers. If network operators are also not able to easily extend their coverage rapidly then only those networks that are located in a particular local area are able to meet the demand from customers in that area. This again points to the appropriate geographic market definition being local. [10]

Competitive conditions in broadband markets have, in addition, evolved differently in the different geographies of Member States. In Spain, for example, the market share of the incumbent operator (Telefónica) in the retail market of fixed broadband services is above 85% in municipalities with less than 1,000 inhabitants and it is close to 40% in medium size municipalities with a population between 100,000 – 1,000,000 inhabitants (see Figure 1 below), where the cable technology has been most successful. Alternative operators using xDSL have been particularly successful in the two largest cities, Madrid and Barcelona, capturing 40% and 45% of the retail broadband accesses. This chart also shows the decreasing importance of alternative xDSL accesses as the size of the municipality (in terms of inhabitants) diminishes.

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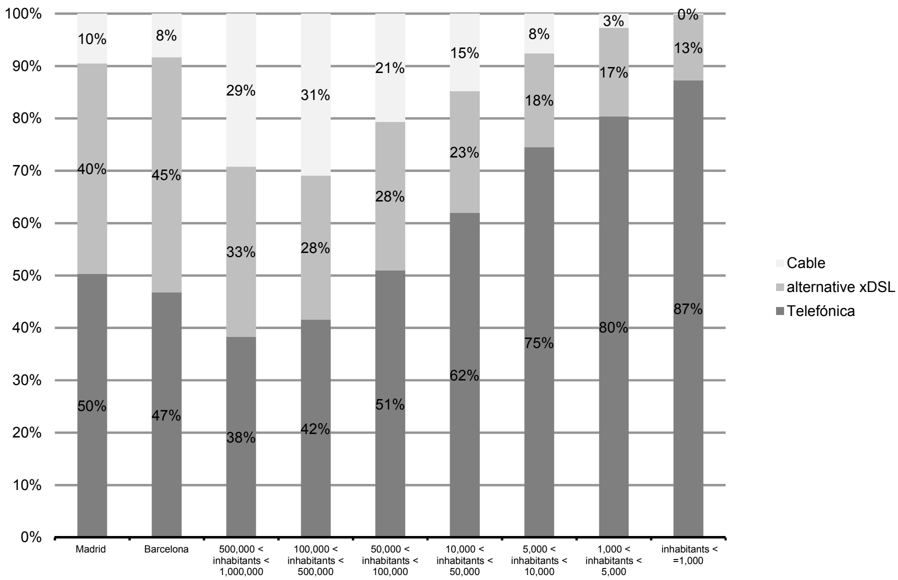
[10] Ofcom confirmed the local nature of the markets for fixed broadband services in its Review of the wholesale broadband access (WBA) market from 23 March 2010 (Ofcom, 2010, p. 40, para. 3.170): "This is because end-users are unlikely to move home to benefit from lower broadband prices and supply-side substitution requires significant sunk costs."

Figure 1 - Retail broadband share by operator's type in different municipalities (June 2010)



Source: CMT

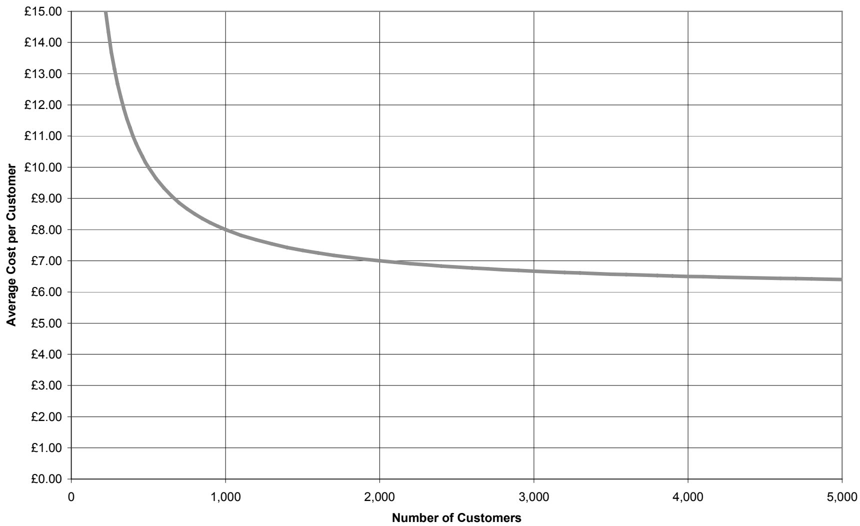
The above data reflects the likely strategy of alternative operators, to adopt an entry strategy at sub-national level, focusing their investments in the areas of the country with higher expected levels of profitability. For example, in Spain cable operators have been particularly aggressive and successful in certain regions of Spain (such as the Basque Country, Cantabria, Asturias and some parts of Galicia), whereas LLU operators have mainly focused on highly populated areas.

This is consistent with the economies of scale associated with the provision of broadband services, as shown by Figure 2 below, which plots a stylized cost function for local exchanges based on the number of customers that are served by the LLU operator (Ofcom, 2010).

Further, economies of scope may also differ at geographical level: the possibility to exploit economies of scope is likely to be higher in areas where customers are more prone to acquire several communication services, such as triple play bundles. These are more likely to be urban/high income geographic areas.

As shown by Figure 1 above, the differential entry strategy by alternative operators depending on the geographic area is reflected in the incumbent operator's market share. Figure 3 below plots the market share of BT in each of the relevant geographic markets identified by Ofcom, namely in the 3 geographic markets where BT is present. According to this evidence, whereas BT's average share in geographic market 1 (where only BT is present) is close to 99%, its share falls to 28.50% in market 3 (exchanges with 4 or more Principal Operators present or with 4 or more forecast). [11] [12]

Figure 2 - Stylized LLU cost function for local exchanges by number of customers



Source: Ofcom, "Review of Wholesale Broadband Access Markets, Consultation on market definition, market power determinations and remedies", 23 March 2010

Therefore, *a priori*, the economics of the provision of broadband services suggest that it is appropriate to consider in the first instance local, rather than national, markets for broadband services. [13]

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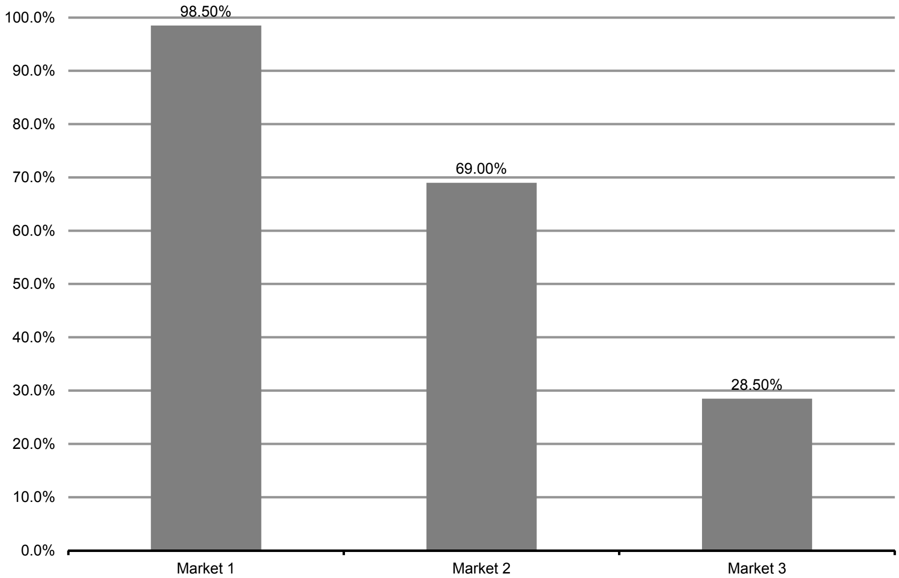
[11] Market 2 consists of exchanges with 2 or 3 Principal Operators present.

[12] A Principal Operator was defined as BT, an LLU operator with a nationwide coverage of more than 10% (which, at the time of the market review, amounted to six LLU operators prior to TalkTalk's acquisition of Tiscali) or Virgin Media where cable coverage in an exchange area was more than 65% of end user premises. See paragraph 3.224 of Ofcom (2010).

[13] A U.S. Department of Justice letter to the Federal Communications Commission from 4 January 2010 states that "Broadband markets are local in nature as customers can choose only among providers that serve their neighbourhoods, and the providers and service offerings differ from one area to another." See http://www.justice.gov/atr/public/comments/253393.pdf

Figure 3 - BT's market share in the WBA market by geographic market type (September 2009)



Source: Ofcom (2010)

Despite the above, in most countries, broadband markets (at wholesale level) have been defined nationally. One of the factors that has contributed to this approach is the observation of a national pricing policy by incumbent broadband operators. However, from an economic perspective, a national pricing policy is not necessarily inconsistent with sub-national markets. If a supplier applies a national pricing policy in a world where markets are regional in scope, it will set its prices considering the aggregated demand that results from the local consumer purchasing decisions (in those areas where it is present). In other words, it is the average level of competition across all localities that will determine the level of the national price. Strictly speaking therefore, it would be correct to maintain that broadband operators compete in a large number of local markets, even though they adopt a national pricing policy: national prices will be a function of the sum of the many local competitive conditions that they face, also known as the common pricing constraint. [14] [15] [16]

[14] For a formal analysis see VALLETTI *et al.*, 2002.

[15] There are precedents from other markets (e.g. supermarkets in the UK) where markets are considered to be local in nature, in the presence of national pricing.

[16] Note also that national pricing may be due to regulatory constraints.

Further, even in the presence of a common price at national level, there may be significant differences in non-price dimensions of competition, like product variety, promotional campaigns, etc. For example, broadband speeds available (for downloading and uploading) are likely to differ at geographical level. Hence, the presence of a common pricing constraint may be a necessary but is not a sufficient condition for the existence of a national market.

Commission's view on geographic market segmentation

Even though there are no official formal guidelines provided by the Commission on geographic market segmentation, the Commission has expressed its view on the issue when replying to NRAs' market reviews. In particular, the Commission considers that: [17]

- de-regulation of sub-national markets should be based on the evaluation of sound and evidence-based criteria;
- the conditions of competition within each proposed market should be sufficiently homogeneous and different from neighbouring markets; and
- market boundaries should be sufficiently stable to identify those areas where de-regulation could be justified.

The Commission has also provided some insight on the indicators that could be used to assess whether conditions of competition within a geographic area are sufficiently homogeneous for that area to be potentially considered a geographic market, including:

- the distribution of and evolution over time of markets shares;
- evidence of differentiated pricing;
- pricing of both the incumbent and alternative operators as well as its evolution over time in the relevant areas; and,
- additional supply and demand characteristics which might indicate the existence of different competitive pressures.

Whereas these criteria look reasonable, in practice their implementation has proved to be somewhat debatable for a number of reasons:

- Different interpretation seems to have been given to the common pricing constraint condition. For example, in Austria the regulator concluded on a national market due to the common pricing constraint despite the

[17] See for example EC, 2007.

variations in competitive conditions observed at a sub-national level. [18] This was also an element that led the Spanish regulator to define a national market for wholesale broadband access services. [19]

- In some cases, like Austria, the above has led to the imposition of differentiated remedies in different areas of the same relevant market in order to account for the higher competitive pressure faced by the incumbent operator in certain areas. In this regard, there is uncertainty on the conditions under which, in a context where competitive conditions seem to differ across areas, the definition of sub-national markets is more appropriate than the adoption of differentiated remedies within a single market. We comment on this in more detail below.

- There are cases where an initial assessment (for example based on the variation of the market share of an incumbent operator across different geographic areas) suggests there could be scope for geographic market segmentation. The necessary information may not however be available at the appropriate level of disaggregation which makes it difficult to implement an exhaustive analysis of competitive conditions at sub-national level. [20] [21]

A central issue in the delimitation of the geographic scope of wholesale broadband markets is the significance of indirect constraints. This is due to the fact that in most cases, there is an absence of direct restrictions to competition in the provision of WBA services: with some exceptions, in most Member States the only provider of WBA is the incumbent operator. Hence, an analysis of indirect constraints at retail level is likely to be required for an analysis of the geographic scope of WBA markets.

The Commission has recognised the importance of indirect constraints for the analysis of wholesale markets when replying to NRAs market reviews in the context of WBA markets, proposing a three-part test, on which basis NRAs should seek to establish that (EC, 2007; BEREC, 2010):

(i) ISPs would pass a hypothetical wholesale price increase on to their customers at the retail level based on the wholesale/retail price ratio;

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[18] See the Commission's comments to the market review by the Austrian regulator, EC, 2008a.

[19] See the Commission's comments to the market review by the Spanish regulator, EC, 2008b.

[20] This could be overcome through the establishment of a process to compile information at sub-national level. For example, the CMT in Spain carries out on an annual basis an analysis of the state of competition for Internet access services at local geographic level.

[21] See http://www.cmt.es/cmt_ptl_ext/SelectOption.do?nav=inf_ambito_geografico&detalles=090027198009f157&pagina=1

(ii) There would be sufficient demand substitution at the retail level based on indirect constraints such as to render the wholesale price increase unprofitable;

(iii) The customers of the ISPs would not switch to a significant extent to the retail arm of the integrated hypothetical monopolist, in particular if the latter does not raise its own retail prices. [22]

The application of these three criteriamay not be straightforward. For example, there is not a clear threshold in terms of the wholesale/retail ratio above which that ratio is considered to be significantly high. Further, the assessment of the level of substitution at retail level after a hypothetical wholesale price increase may need to be done qualitatively.

There is finally a debate on whether indirect constraints should be considered at the market definition stage or in the analysis of significant market power (SMP). The Commission recommends the assessment of indirect constraints in the analysis of SMP on the relevant market. [23] However, under such an approach there would not be scope for geographic market segmentation in the context of WBA markets, where incumbent operators were the only or main provider of WBA services. There seems to be therefore a potential tension between the Commission informal guide on geographic market segmentation, and the consideration of indirect constraints at the market definition or the assessment of dominance stage.

■ Different markets *versus* different remedies

So far, some NRAs have already considered defining different geographic markets in their countries as the best way to address their competition problems. This is the case of the UK and Portugal. In contrast, some countries have defined a unique national market but have applied different competition remedies to different areas in which competition conditions vary. This is the case of Austria and Poland.

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[22] Basically, what is required is a sufficient level of competition at retail level so that demand substitution occurs at the retail level in response to a SSNIP at the wholesale level to render the wholesale price rise unprofitable.

[23] This has been reiterated by the Commission in its comment letters regarding the WBA market. See for example EC, 2008c.

In both the UK and the Portuguese cases, NRAs defined different markets according to the different competitive conditions of the areas analysed. In 2007 (Ofcom, 2007) the UK defined BT's local exchanges areas as the minimum geographic unit to be analysed. According to Ofcom, competitive conditions of a market are determined by the level of entry in each of these exchanges, given that once an operator has entered an exchange using its own LLU network it has incentives to maximise the number of end-users to amortise the investment. Once analysed, these areas were aggregated depending on the number of principal operators [24]. Three different markets were defined but SMP was only found to be present in two of them. Therefore, remedies were only imposed in those two markets. As for the competitive market, all existing obligations were lifted with a notice period of one year.

In 2008 (ANACOM, 2009; EC, 2008c) Portugal viewed Main Distribution Frames (MDF) as the minimum geographical areas to be analysed, as competitive conditions are more homogeneous in those areas than in municipalities. After being analysed, MDFs were grouped depending on the number of co-located and cable operators in the municipalities in which each MDF were located. According to this, ANACOM defined two different areas (a competitive one and a non-competitive one) and applied different remedies: pro-competitive measures to non-competitive areas and no remedies in the competitive areas.

The case of Austria was different. In 2008 [25], the NRA issued a decision that imposed a national market but different remedies. The process defined the market as being national based on the observation of a common pricing constraint. (EC, 2008a) Subsequently, the competitive conditions in each area were studied and the NRA decided to adopt different remedies for different areas, where competition conditions were different. In particular, TKK (the NRA in Austria) stated that some of the areas did not need any *ex ante* regulation given the competitive pressure.

The most recent example of a similar approach is Poland [26]. In that case, we understand that the NRA defined the geographic scope of the market to be national with the exception of 20 communes that were considered to be highly competitive. For the national market, the NRA considered that

[24] See footnote 12.

[25] See the comments by the EC to that decision, EC, 2008a.

[26] See the EC comments to the Polish NRA market review (EC, 2011).

variations in competitive conditions arose, but that they were not stable and significant enough to distinguish sub-national markets. However, we understand that these differences in competitive conditions between the areas were deemed sufficient for the regulator to propose the adoption of differentiated remedies.

The view of the Commission

As stated in the comments to the Austrian NRA market review, EC (2008a), the Commission has deemed the differentiation of remedies as an appropriate solution under certain circumstances:

> "Based on the general principle that remedies should be tailored and proportionate to the identified competition problem, it can be appropriate for NRAs to impose remedies which take account of locally/regionally differentiated competitive conditions while retaining a national geographic market definition. The geographic differentiation of remedies may be appropriate in those situations where, for example, the boundary between areas where there are different competitive pressures is variable and likely to change over time, or where significant differences in competitive conditions are observed but the evidence may not be such as to justify the definition of sub-national markets. In addition, differentiation of remedies may be appropriate where premature removal of *ex ante* regulation could have significant detrimental consequences for consumers and the competitive process." [our emphasis]

In principle, the implications from defining geographic markets differ from those of imposing different remedies. This is because NRAs are normally expected to adopt at least one regulatory obligation on dominant operators in those markets in which SMP is found. This means that if no local markets are defined, NRAs would be expected to adopt some form of remedy even in the areas where the competitive conditions are found to be strong. By contrast, defining different geographic markets would allow NRAs not to adopt any obligations in areas that are found to be competitive. Put differently, defining a national geographic market may give more control to the NRA and the Commission over the relevant market.

However, in practice there does not seem to be a clear and stable rule for choosing between defining separate geographic markets, or a national geographic market with separate remedies. Considering the Commission comments on the Austrian market review, as alternative operators are likely to have made investments of a sunk nature, be it in end-to-end infrastructure or in LLU, the delineation of the areas where competition is strong is likely to be reasonably stable in nature, in the absence of major changes in technology. In such cases, the Commission's comments on the Austrian decision suggest that differentiated remedies should be preferred where 'significant detrimental consequences for consumers' could be expected from the removal of *ex ante* regulations. Where no such consequences are expected, then sub-national markets should be preferred. As this is a forward looking exercise, there is likely to be some need for guidance on the approrpiate interpretation of what may constitute significant detrimental consequences for consumers.

One possible 'outcome' based approach, which would be consistent with the competition based principles of the regulatory framework, could be to consider the observed market outcomes: for example, in defined geographic areas where no operator enjoys a position of strength, as reflected in a significant market share, there could be a presumption that the removal of any *ex ante* regulation would not be expected to lead to such detrimental consequences for consumers.

In the absence of any further and more detailed guidance from the Commission, the significance of this distinction in practice is likely to depend on the approach of different NRAs to the issue of remedies. Whilst the possibility of imposing differentiated and 'lighter' regulatory obligations in competitive areas exists, there are still reasons to consider the provision of more concrete guidance for NRAs to prefer one of the approaches over the other. For example:

- A differentiated approach could still lead to operators facing some obligations in one Member State, and not facing an obligation in another, even though the competitive conditions could be very similar. This could potentially create some regulatory barriers to the support of the creation of a single 'homogeneous' EU telecommunications market, where remedies are applied consistently.

- It is likely that there will be similar data requirements to support the assessment of the strength of the case for different geographic markets. There may be significant benefits from seeking to adopt a consistent approach across Member States to the issue of how local markets should be defined.

- The monitoring of the implementation of different remedies in the same national market could arguably be more demanding than the costs of monitoring a single set of remedies in a national market. For example, where some form of regulatory accounting obligation is considered appropriate, requesting an operator to provide national regulatory accounts which would reflect a mix of products offered in competitive and non-competitive markets may not provide the NRA with the information required to monitor the behaviour of the SMP operator in the markets where the operator actually has market power. Under separate geographic markets, such an obligation could be imposed, to the extent that it is possible to restrict the reporting of the products sold in the areas where the operator was found to have market power. Any such cost should be considered in the context of the potential detriment from the adoption of a national remedy where the variation in competitive conditions would indicate that a sub-national approach to market definition (and/or remedies) was appropriate.

■ The implications of NGA roll-out for geographic markets

Broadly speaking, NGAs (Next Generation Access networks) imply the upgrade of existing copper networks to fibre -by investing in either fibre to the note (FTTN) or fibre to the home (FTTH). NGAs are considered to be the future of broadband in view of the limitations reached by current networks and the ambitious objectives set out in Europe's Digital Agenda. [27] [28]

The evolution towards NGAs (Next Generation Access networks), however, is likely to exacerbate differences in the competitive conditions across different areas as operators will only invest in the areas where the provision of super-fast broadband services can be expected to be profitable. For example, in the UK, BT's original plans for roll-out of SFBB were to cover in the first instance 40% of the UK, predominantly in urban and more densely populated geographic areas. This is consistent with the findings of a study for ECTA which assessed the costs of investing in NGAs, considering different technological alternatives and geographies, and concluded that a nationwide NGA roll-out was not profitable in any of the countries considered (WIK-Consult, 2008). [29] In particular, the study finds that economic viability of NGA is at stake in less densely populated areas.

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[27] http://ec.europa.eu/information_society/digital-agenda/index_en.htm

[28] The Europe 2020 strategy seeks to ensure that, by 2020, (i) all Europeans have access to much higher internet speeds of above 30 Mbps and (ii) 50% or more of European households subscribe to internet connections above 100 Mbps. See EC, 2010c.

[29] Germany, France, Sweden, Portugal, Spain and Italy.

The proliferation of Public-Private Partnerships (PPP) for the deployment of next generation access networks (NGANs) in certain areas, which are unlikely to be served by private investment, [30] corroborates the above findings. In this regard, the Commission approved in 2010 the use of €1.8 billion public funds for broadband development to ensure high speed internet access in rural and remote areas, accelerating private and public investments in the sector. [31]

Therefore, the evolution towards NGAs will maintain the debate on geographic market segmentation. On this matter, given the potential impact of NGA deployment on the topology of broadband networks, the approach to consider the geographic scope of WBA markets in an NGA environment will need to be adapted. For example, if the business models of alternative operators are affected by NGA deployment, for example by local loop unbundling not being feasible, then there could be the possibility that some local geographic markets that have been found to be competitive, like parts fo the WBA market in the UK, may not be so under the new network architecture, unless new entrants invest deeper in the network, e.g. through duct access.

AMENDOLA & PUPILLO (2008) analyze the implications of NGA deployment on access regulation, focusing on the Italian case. The authors consider that a proper regulatory approach towards NGAs requires recognizing the different conditions of competition at geographical level based on the underlying cost conditions of entry and the presence of alternative platforms, limiting *ex ante* interventions to those enduring economic bottlenecks found on a level of specific geographic markets. On the potential impact on LLU, AMENDOLA & PUPILLO (2008) consider that in some situations, e.g. in metropolitan areas, there is a business case to invest in fibre for alternative operators, mentioning the cases of Iliad in France and NetCologne in Germany. This may have implications on the geographic dimension of unbundled access markets and the need for regulation in areas where infrastructure competition based on fibre networks is possible.

30 In 2010, the Commission adopted a record number of 20 decisions covering aid for broadband development in, among others, Catalonia, Finland and Bavaria. See http://europa.eu/rapid/pressReleasesAction.do?reference=IP/11/54&format=HTML&aged=0&language=EN&guiLanguage=en

31 See http://europa.eu/rapid/pressReleasesAction.do?reference=IP/11/54&format=HTML&aged=0&language=EN&guiLanguage=en

Another issue that has gained importance with the deployment of NGAs is the symmetry of regulation of fibre networks. In France, ARCEP has established symmetric regulation with regards to FTTH roll-outs, considering that it is not appropriate to impose asymmetrical obligations only to fibre deployed by France Telecom. [32] Nonetheless, ARCEP will monitor the market and revert to asymmetrical regulation in case symmetry does not result in a competitive market structure. HOERNIG (2011), has recently developed a simple model to investigate the impact on consumer surplus and welfare of symmetric regulation. Overall, he finds that symmetric regulation is likely to lead to higher consumer surplus. In its model, based on the presence of two infrastructure incumbent operators (e.g. a copper and a cable network), asymmetric access regulation of one network does not control sufficiently for market power and benefits the unregulated network.

■ Conclusion

One of the concerns for the Commission in its objective to achieve an internal market in communications is the heterogeneity of approaches adopted by NRAs. [33] Defining different geographic markets where the competitive conditions differ sufficiently should not be seen in principle as an impediment for the development of a single EU telecommunications market being consistent with the principles and application of the EU telecommunications framework: the EU removed in its recent revision of the EU framework those markets where competition had developed sufficiently, from the list of markets susceptible to *ex ante* regulation, leading to a reduction of these markets from 17/18 to 7 in the last review of markets it undertook.

Although the Commission has expressed its view on geographic market segmentation in comments to NRAs' market reviews in the context of WBA markets, there still seems to be some uncertainty at the implementation stage with relatively few precedents. Further, there does not appear to be an established approach for NRAs to decide between defining different geographic markets, or adopting a national market definition with

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32 http://www.arcep.fr/index.php?id=8571&L=1&tx_gsactualite_pi1[uid]=1365&tx_gsactualite_pi1[annee]=&tx_gsactualite_pi1[theme]=&tx_gsactualite_pi1[motscle]=&tx_gsactualite_pi1[backID]=26&cHash=dba5f85bb0

33 http://europa.eu/rapid/pressReleasesAction.do?reference=IP/10/644

differentiated remedies, depending on the competition conditions in different areas.

The evolution towards NGAs is expected to increase the importance of the geographic dimension of WBA markets as their deployment is unlikely to be homogenous at geographical level.

In view of the above, there seems to be a need to consider more specific guidelines for the consideration of separate geographic markets, and the criteria for NRAs to choose between sub-national markets or differentiated remedies. Given that one of the main limitations for the assessment of the dimension of the geographic market is the lack of disaggregated data, the adoption of guidelines on the dimensions that could be used for defining local markets, and a more consistent approach for the collection of data at sub-national level, also seem appropropriate.

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