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Geographically Segmented Regulation for Telecommunications

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Working Party on Communication Infrastructures and Services Policy

GEOGRAPHICALLY SEGMENTED REGULATION FOR TELECOMMUNICATIONS

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FOREWORD

The Working Party on Communication Infrastructures and Services Policy discussed this paper at its meeting in December 2009. The Working Party agreed to recommend the paper for declassification to the Committee for Information, Computer and Communications Policy (ICCP). The ICCP Committee agreed to the declassification of the paper in March 2010.

The paper was drafted by Professor Patrick Xavier, Curtin Business School, Curtin University of Technology (Australia), consultant to the OECD, under the direction of Dimitri Ypsilanti of the OECD's Directorate for Science, Technology and Industry. It is published under the responsibility of the Secretary-General of the OECD.

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MAIN POINTS

Regulatory authorities in most OECD countries have traditionally adopted a national geographic area focus when framing the geographic scope of telecommunications markets. The increase in the number, coverage and market share of "alternative" networks or operators has resulted in differences in competitive conditions between geographic areas. Arguments stemming from market analysis economics suggest that differential regulation be considered between geographic areas where facility-based competition has developed and where it has not. Increasingly, incumbent operators and some regulators have argued that regulatory forbearance be adopted in geographic areas (usually the more densely populated cities) where facility-based competition is developing.

The aim of this paper is to appraise the case for, and developments in, the use of sub-national geographically segmented regulation for fixed telecommunications networks. This appraisal is timely because, since Ofcom's decision to install geographic regulation in the United Kingdom, and the approval given by the EC, there has been heightened interest in such an approach, with a number of OECD countries setting out to implement it. The appraisal is also timely because there are now some insights gleaned from the experience several OECD countries have had in the practical implementation of geographic regulation, including Australia, Austria, Finland, Portugal, Spain, the United Kingdom and the United States.

Certainly, geographically segmented regulation is a rational approach. Its claim to facilitate streamlined, better focused, regulation is in accord with widespread agreement that regulation applied to telecommunications (as elsewhere) should be no more than the minimum necessary. Geographically segmented regulation thus may enable the benefits of such deregulation to be realised in certain locations, even if the competitive situation would not warrant such deregulation nationally. But geographically segmented regulation should aim not only at facilitating deregulation but also at strengthening regulation in those regions where competition is assessed to be ineffective. That is, regulators could also use geographic segmentation to impose additional regulations in a targeted manner in the specific locations where regulation proves necessary. Thus, geographically segmented regulation can assist regulators to ensure that the regulatory framework they apply is appropriately tailored to the competitive situation.

Geographically segmented regulation is not without its costs, however. Notably, there can be potential difficulties, complexities and uncertainties in its application. The paper's aim is to complement previous documents, notably by the European Regulators Group (ERG 2008c) Common Position on Geographic Aspects of Market Analysis, by making policy makers and regulators more fully aware of the potential costs and benefits of the approach when deciding whether to adopt it.

Determining whether it is appropriate to delineate markets more narrowly than on a 'national' basis, and if so, how they should be segmented is a complex task. A geographic market approach requires defining a market at the geographical level and then undertaking market power assessments for each of the designated geographic areas. This analysis is not always straightforward. In practice, a regulator may not always be able to define all relevant geographic markets in a rigorous economic sense, particularly if the theoretically appropriate geographic market would be a particular customer location. Compromises may have to be made. The experience of several OECD countries demonstrates that identifying relevant criteria for the definition of geographic markets and the segmentation of the market is possible and can be effective, but can be complex. A diverse set of information has to be integrated when undertaking the market definition exercise and the related competition assessment – including assessment not only of the state of *actual* competition, but also of the *potential for* effective competition expected to develop over a period of time.

It is important that regulators accurately determine whether geographically segmented regulation is appropriate. When effectively implemented, geographic segmentation will promote competition and investment and serve the long-term interests of end-users. Prematurely deregulating specific geographic markets could be harmful, including reversing developments of increased competition in the market. Conversely, failing to lift *ex ante* regulation in areas where effective competition exists may also be harmful. In addition, it may make sense for some countries to utilise geographically segmented regulation and for others to decline to do so. Indeed, some countries may be obliged to apply geographic regulation where clear evidence exists that sub-national markets can be defined (*e.g.* EU Member States). However, other OECD countries may have more flexibility in regard to the use of geographic regulation as regulators in these countries may be able to implement a policy-driven approach, even where the available evidence suggests that local geographic markets be defined under a competition law approach.

The overall question regulators need to address is whether the benefits of a reduction in regulation in certain areas facilitated through geographically segmented/differentiated regulation outweigh the costs associated with the additional complexity of administering the resulting regulatory regime. Countries considering its implementation will need to consider how such problems will be addressed and the costs minimised. As with regulation at the national level, the criteria applied by regulatory authorities to justify regulation or deregulation on a geographically segmented basis must be robust, evidence-based, consistent, and they should lead to non-ambiguous decisions. *There is need for as clear and unambiguous criteria as possible according to which the geographic units are grouped, competitive conditions assessed and remedies applied.* The experience of countries that have implemented geographic regulation confirms the need for such criteria.

In some countries, competitive conditions may vary within the national market, but not to the extent that warrants a definition of sub-national geographic markets. In this case it may be appropriate to differentiate remedies within the national market. However there are concerns that the definition of a threshold between sub-national geographically segmented regulation and conditions warranting the differentiation of remedies within a single national market is unclear and that this could give rise to arbitrary decisions by national regulators. *Clear guidelines that precisely specify the conditions under which each of the two distinct approaches (geographically segmented regulation or differentiation of remedies) should be used are needed.* This will help dispel fears that regulatory authorities might use differentiated remedies to regulate or deregulate a market as a substitute for market segmentation (since this may be more difficult to justify).

A number of potential problems need to be addressed. In addition to the challenge of reaching agreement as to the right principles to use when defining the geographic units, competitive conditions and remedies relevant to geographically segmented regulation, there are challenges that need to be overcome when applying these principles. For instance, there is the potential for market boundaries to be unstable over time. Also, to the extent that different technologies have different geographic footprints, the possibility arises that this could lead to distortions if different technologies of increasing substitutability (because of convergence) are regulated differently under a geographic regulation regime.

It is crucial that a regulatory regime does not unduly distort the use of any technologies or platforms in the delivery of services to end users. A multi-platform environment, allowing services to be made available from a range of networks, is critical to sustaining investment and innovation and thereby maximising choice and benefits to residential and business consumers. Such concern applies, however, regardless of whether the regulatory regime operates in geographically segmented sub-national markets or national markets.

A rule of thumb approach to assessing competitive conditions seems commonly used but should constitute only a preliminary part of the analysis of competitive conditions that must precede a

deregulatory decision. Clear guidelines are necessary concerning assessment of the nature and extent of sustainable competitive conditions and the evidence required to support decisions regarding withdrawal or retention of *ex ante* regulation.

There is uncertainty stemming from continuing disagreement over whether withdrawal of access regulation facilitated by geographically segmented regulation would promote or hinder investment towards facilities based competition. Supporters of continued access regulation recognise the benefits of facilities based competition and, indeed, seek to achieve it. *Regulatory authorities can seek both simultaneously; with the right price for access services in place, access regulation can provide steps in a 'ladder of investment' towards infrastructure competition.* Thus, access regulation should continue to be in a regulator's toolkit especially since it may be critically important in a Next Generation Access (NGA) environment. More broadly, when performing a market power analysis, one needs to consider whether competitors would remain in the market in the absence of *ex ante* regulation, such as access regulation.

It is possible that investment in areas which remain regulated (*e.g.*, sparsely populated rural areas) will be adversely affected by geographic regulation. This is because the incumbent's priority could become investment in areas open to competition to enhance its competitive prowess, and this could, in turn, result in competitive operators also focusing more attention to these areas rather than in rural areas.

Asymmetric geographic regulation may also result in geographic price differentiation, where national price averaging is the norm, at the wholesale and retail level: lower prices in competitive cities and higher prices in smaller cities and rural regions. De-averaged wholesale access prices under geographic regulation could for consistency necessitate de-averaging in the price of unbundled local loops (ULL), practiced in some countries, resulting in higher prices for ULL in less populated areas.

The onset of NGA networks has implications for the competitive conditions in access markets that are still uncertain, including the "stranding" of exchanges, the role of bitstream, sub-loop unbundling access to ducts, etc. *Regulators should ensure that LLU and sub-loop unbundling, bitstream, the transition to NGA, access to ducts and dark fibre, inside (building) wiring, collocation, and backhaul are defined in a transparent, efficient, and technologically neutral manner.*

Competitive operators should be able to choose between different access opportunities that are suitable for different conditions. *Regulators should ensure that new network elements designed by dominant operators respect regulatory obligations regarding access in a transparent and efficient manner.*

Uncertainty over the implications of NGA should be taken into account when considering the effects of geographically segmented regulation. Such investment may change market power. In particular, market power could change depending on the network configuration used in rolling-out fibre to the home. This suggests that, where possible, it might be sensible for regulators to be cautious and to take into account NGA deployment before deciding whether to install geographically segmented regulation.

GEOGRAPHICALLY SEGMENTED REGULATION FOR TELECOMMUNICATIONS?

SECTION 1. INTRODUCTION

1.1 Aim of the paper

The aim of this paper is to appraise developments in the use of sub-national geographically segmented regulation in OECD countries. This appraisal is timely because, since Ofcom's decision to introduce geographic regulation in the United Kingdom, and the approval given by the European Commission, there has been heightened interest in such an approach, with a number of OECD countries setting out to implement it. Certainly, since the expressed aim of many policy makers and regulators is to reduce *ex ante* sector-specific rules progressively as competition in the market develops, the rationale for such an approach is appealing. In principle, sub-national geographically segmented regulation seems consistent with reducing the scope of *ex ante* regulation (in favour of *ex post* regulation on the basis of general competition law). Thus, *a priori*, the demand of incumbents for such a regulatory regime should be viewed favourably. But it has wide-ranging effects that warrant attention to make policy makers and regulators more fully aware of associated potential problems and costs. Countries considering its implementation will need to consider how the scheme's problems will be addressed and the costs minimised.

Towards this end the paper:

i) Examines the rationale and need for a sub-national geographically segmented regulatory approach

ii) Identifies products that have been candidates for geographic regulation

iii) Examines processes used for choosing an appropriate geographic unit and for aggregating them

iv) Discusses whether and when the use of differentiated remedies in a single national geographic market is appropriate

v) Considers potential problems and costs that may result from a geographically segmented approach

vi) Considers whether it will promote competition in the interests of economic efficiency and consumers

vii) Questions whether it will be conducive to investment

viii) Considers whether it is likely to promote competition and investment in an NGA environment; and

ix) Assesses whether it will serve the long-term interests of end-users.

1.2 Structure of paper

Following this introduction, Section 2 examines the principles of market definition and analysis, including the criteria for choosing a product and geographic unit, as proposed by the European Regulators Group (ERG) and others. Section 3 examines the approaches used in practice by OECD countries that have already applied sub-national geographically segmented regulation in order to glean information about its efficacy. Section 4 discusses the implications of geographic regulation for competition. Then section 5 looks specifically at the implications for price regulation, including 'margin squeeze' and its potential effect on competition and uniform pricing (an aspect of universal service). Section 6 examines the implications for investment, including investment in less-populated rural areas. Section 7 adopts a forward-looking perspective which recognises the onset of NGA. Section 8 draws the conclusions of the paper.

1.3 The debate over sub-national geographically segmented regulation

In a sense, sub-national geographically focused regulation is not new in that regulation has had a regional/statewide focus in the United States, Canada and Finland for many years. But the sub-national regulatory differentiation in these countries is commonly based on political/administrative boundaries.[1] What is at issue in this paper is whether, and if so, how to delineate market boundaries based on the level of competition. In the EU, regulators in Member States are obliged to apply geographic regulation where clear evidence exists that sub-national geographic markets can be defined, as the EC's regulatory framework for telecommunications markets requires regulators to define markets consistent with competition law principles.

Regulatory authorities in most OECD countries, including the EU, have traditionally adopted a national geographic area focus when framing the geographic scope of telecommunications markets. In recent years there has been an increase in the number, coverage and market share of "alternative" networks or operators such as resellers, unbundling operators, cable network operators, operators using frequencies for WLL/WiMax, or operators deploying optical fibre in the local loop. This has resulted in differences in competitive conditions between geographic areas, and this, in turn, has led to increasing argument (especially from incumbent operators) that geographical aspects be recognised in market/competition analysis and in regulatory decisions.

The reasoning behind such arguments in favour of sub-national geographically segmented regulation is appealing in view of the widespread agreement that regulation applied to telecommunications (as elsewhere) should endeavour to be the minimum necessary. Thus, if in specific areas of a national market, effective competition prevails so as to permit regulation in these areas to be withdrawn, then this opportunity to streamline regulation should be taken. In this way, the fact that some areas of a national market do not display the degree of competition to justify deregulation would not inhibit deregulation in areas that are competitive. Recently, an increasing number of incumbent telecommunication operators have been arguing that *ex ante* regulation of wholesale access markets should be withdrawn in areas where

1. The US Federal Communications Commission (FCC) has adopted various geographic areas in considering whether to relax or forbear from regulation.

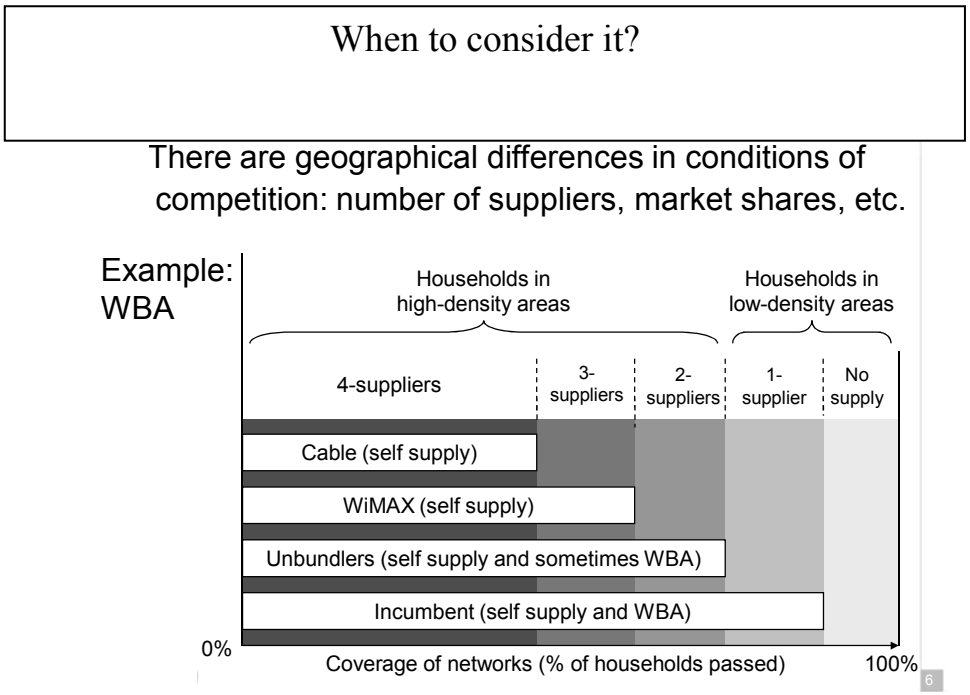
competition prevails (mainly the high-density urban areas) and that failing to do so provides unnecessary protection to access-based competitors and lowers incentives to invest in infrastructure.

Figure 1 illustrates a scenario of the differences in competitive circumstances that may warrant geographically segmented regulation. There are various reasons why infrastructure-based competition has developed unevenly (and why it may continue to do so) including: economic conditions; population density; demographic factors; technical supply side issues; and the regulatory framework itself. With geographically disaggregated regulation, *ex ante* regulation in high-density competitive areas can be removed while continuing to regulate in less competitive rural/low-density areas. Indeed, the European Commission's (EC) regulatory framework for telecommunications markets and the underlying competition law principles already recognise the possibility of defining sub-national geographic markets where appreciably different conditions of competition exist. However, while all parties recognise the appropriateness of withdrawing or forbearing regulation in areas where competition is shown to be effective and sustainable, there are also concerns over the significant risks from premature de-regulation. In particular, there are concerns that incumbents, with their advantages, including national coverage capabilities and economies of scale and scope, access to legacy infrastructure (such as ducts), customer information, etc., could have increased ability to leverage any pricing and other operational freedom arising from geographic de-regulation. There are concerns that such a step has uncertain outcomes and, indeed, could threaten competition, since it has implications for investments in infrastructure.

The European Regulators Group argues (ERG 2008a) that while it is likely that some errors may occur, the alternative – geographically uniform regulation - could result in much larger errors. In fact, the ERG argues that in a market where there are significant geographic variances in competitive conditions, regulation based on average market conditions does not properly match real market conditions: while the reality of the market shows variation among geographic areas, all are currently treated as if they reflect the "average" situation.

It is important to note that the ERG (2008a) points out that it views geographic regulation not as a tool for deregulation, but rather for *appropriate* regulation. That is, geographic segmentation (if appropriate) might not only lead to deregulation of areas where an operator is incorrectly found to hold SMP in an "averaged" national assessment but might also lead to regulation in areas where an operator is incorrectly found to be competitive in an "averaged" assessment (but in fact does possess SMP in some geographic areas).

Figure 1. Example of geographical differences in competitive circumstances



Source: Towards geographical differentiation of broadband regulation? Paper presented to the 3rd Black Sea and Caspian Regulatory Conference, Istanbul, 22-23 May,20008.

A range of questions and concerns emerge, however, as the concept of geographically segmented regulation is unpacked. For example, what are the benefits and costs of defining sub-national markets and geographically differentiating remedies? Do the benefits exceed costs? Are there objective and clear criteria for defining sub-national markets? Is geographically disaggregated data necessary? How can a company's accounts be reliably separated, and importantly, on what basis should costs that are shared between different geographic areas be allocated? What are the consequences for the future availability of wholesale offerings if access obligations are removed in parts of a country? What is the impact on prices across access levels and what is the impact on alternative operators and competition in the retail broadband access market? What are the likely impacts on access prices and also on end-user retail prices? Importantly, is there persuasive evidence that consumers will benefit from geographically segmented or differentiated remedies? Should regulators bother about sub-national market definition or implement geographically differentiated remedies based on Significant Market Power (SMP) without segmenting a national market? These are some of the issues that have been raised in the debate and a number are at the core of the present regulatory debate in some countries.[2] With the onset of next generation access networks (NGA), it seems timely for OECD countries to re-think the regulation of access services, including the role of geographically segmented regulation.

2. As Oxera (2008) put it: "Indeed, geographic segmentation lies at the core of the European incumbents' position in the debate on the reform of the EU telecoms regulatory framework. As identified by the European Telecommunications Network Operators' Association (ETNO), national incumbents see geographic segmentation of markets and/or remedies as a way of freeing themselves from what they perceive as burdensome access obligations in areas where they face, or have the prospect of facing, competition from other operators." (p.1)

Access providers are generally in favour of sub-national geographically segmented regulation

Access providers, usually the incumbent operators (the former monopoly operators), are generally in favour of geographic differentiation. In Germany, Deutsche Telekom (2008) argues that there is need to significantly strengthen the role of geographic aspects within market analysis since geographical segmentation can pave the way towards better targeted regulation. In Spain, Telefonica (2008) claims that "…the geographical segmentation model will push investments and gradual deregulation and users will always enjoy the best possible scenario, either with a sustained or a regulatory supervised market…Differentiated regulation would prevent the increase of the digital divide." In Australia, Telstra (2006) argued that geographically segmented regulation: "…will promote competition by giving service providers the appropriate incentives to use and extend alternative infrastructure, and will also promote competition in the upstream local services market by encouraging other carriers to offer wholesale local services."

Access seekers are generally against sub-national regulation

Access seekers typically argue in favour of a national market focus and against disaggregating markets. This is because a national market definition is far more likely to indicate the existence of a dominant incumbent operator than sub-national geographical markets - some of which could be assessed as being competitive and accordingly qualifying for deregulation. For instance, Colt Telecommunications (2008) considered that implementing a regulatory regime based on different geographic markets could prove counter-productive in terms of efficiency and effects on competition and investment. In Colt's opinion, in considering geographic segmentation, a regulator should conduct and publish a full cost benefit analysis of the move including:

- The benefits of more targeted regulation
- The costs associated with a more complex regulatory regime, such as increased risk of mistakes and increased uncertainty
- The likely effect of deregulation on current market participants;and
- The macroeconomic effects of deregulation in certain areas.

Fastweb (2008), another competitive operator, considers that geographic segmentation should not be applied because of the unstable boundaries which characterise telecommunications markets. In Fastweb's view, geographical segmentation of remedies should be considered only in exceptional circumstances as both the probability for regulatory errors and regulatory and administrative costs for both regulators and operators are high and the damage to competition from premature deregulation may be irreversible.

Consumers

The impact on consumers is a crucial consideration, especially in view of the often-repeated statements by politicians and regulators that policy and regulation are designed to be in the long-term interest of consumers.[3] Indeed, in Australia, the over-riding criterion to be applied in assessing whether to apply geographic deregulation is that a decision to do so must be in the Long-term Interests of End-Users (LTIE).

In response to an Australian Competition and Consumer Commission (ACCC 2008a) draft decision, the Australian Telecommunications User Group (ATUG 2008) submits that more work is needed to define geographically segmented markets from the perspective of end users. ATUG considers that in view of

3. This is often expressed explicitly in legislation *e.g.* the Australian legislation pertaining to telecommunications.

concerns about the uncertain outcomes (*e.g.* the extent of "stranded assets") stemming from next generation access networks (NGA) developments, it would be sensible to defer use of geographically segmented regulation until the implications of NGA development on Local Loop Unbundling (LLU) based competition are clearer.

Business users

Fragmentation of market analysis to sub-national level is a source of significant alarm to business users, especially concerning wholesale broadband access services. For multinational business users, inconsistency of national regulations, and a consequent inability to obtain seamless international network services without service quality, costs and administrative disadvantages, is already a serious problem. For instance, the EU already suffers geographic segmentation at Member State level. Extending this to sub-national level makes matters worse, even creating problems for businesses simply operating within one country, many of which are within the key SME sector. The International Telecommunications Users Group (INTUG) points out that the ERG has acknowledged the need to distinguish between mass consumers and business users when doing market analyses and is emphatic that the "damaging impact on multi-site/business users of geographic segmentation of telecom regulation" should be recognised.[4]

INTUG submits[5]: "There is an alarming and perhaps unintended consequence in the unfettered application of geographic segmentation. It appears to condone or promote infrastructure duplication *per se*, as a proxy for encouraging ICT investment for economic growth, and as a mechanism for addressing enduring bottlenecks. This is misplaced. Multiple studies, for example by WIK Consulting and Analysys/Mason in Europe, have demonstrated that there is very little investment justification for duplicating new fibre infrastructure *per se*, since in most cases it is inefficient investment."

Regulatory authorities

The definition of the scope of geographic markets by regulatory authorities in their analysis is required by the EC Framework Directive (2002), where article 15, paragraph 3 establishes that:

> "National regulatory authorities shall […] define relevant markets appropriate to national circumstances, in particular relevant geographic markets within their territory, in accordance with the principle of competition law".

In accord with this Directive, in the European Union, in carrying out any *ex ante* market assessment, the national regulatory authority (NRA) must define the geographic scope of a market on the basis of evidence and without preconceptions as to what the scope is. The methodology to be used was outlined by the EC Guidelines on Market Analysis and the Assessment of Significant Market Power (2002). As such, NRAs within the European Union operating under the Framework have to base market definitions on an assessment of the available evidence, not on an assessment of relative costs and benefits of adopting a local or national geographic market definition.

In Australia, the ACCC (2006) recognised that the *ex ante* regulatory framework should reflect the fact that infrastructure-based competition (either full-facilities or quasi-facilities) is likely to emerge (and has emerged) differently in different geographic regions. The ACCC (2006) considers that the regulatory regime should be flexible enough to:

4. INTUG submission to OECD concerning the draft report on "Geographically Segmented Regulation in Telecommunications", December 2009.

5. *Ibid*.

- Withdraw from certain types of regulation in geographic areas where it is no longer required to promote the long-term interest of end-users (LTIE); and
- Remain targeted at those areas where it is required to promote the LTIE.

In the United Kingdom, in the context of its Strategic Review of Telecommunications, Ofcom (2006) announced its intention to conduct analysis applying the concept of geographically segmented markets. Ofcom at that time also recognised that the development of regulatory remedies may vary according to the extent of competition within a single national market.

In Germany, too, the question of geographically differentiated regulation (for the bitstream access market) has been raised (BNetzA, 2008).

1.4 Geographic differentiation of remedies in a single national market

The EC and ERG consider the possibility that regulatory remedies could be varied within a single national geographic market. For instance, the ERG (2008a) maintains that geographical variation in remedies may be justified even if markets are national in character (*e.g.*, due to common pricing constraints). ERG contends that, notwithstanding the presence of common pricing constraints, demand and supply conditions may be very different at a local level. Therefore, long-term prospects for infrastructure competition may differ significantly within a national market. In such circumstances, ERG concludes that a geographic differentiation of remedies can be justified. The use of geographic segmentation of a national market or differentiated remedies within a single national market is to be determined by the degree of homogeneity of competition. However, ERG makes it clear that the two approaches should not be viewed as two alternative, equally applicable options by regulators.

The EC's view (2008a) is that: "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." Nevertheless, the EC states (2008b) that were the market to develop in such a way that there would be evidence of sustained heterogeneous competitive conditions (*e.g.* at the stage of the next market review) an NRA should consider defining sub-national markets.

In Colt Telecommunications' (2008) view, it may be desirable to first introduce differentiated remedies and only eventually to proceed to modify market definition. Cable Europe (2008) agrees, arguing that the advantage of utilizing differentiated remedies is that it avoids the potential that the identification of sub-national geographic markets has to create many complications in the coherent and consistent implementation of the EU Regulatory Framework: "We consider that there are many analytical, practical and technical reasons why NRAs need to approach the issue with great caution, especially when dealing with wholesale local access markets and we therefore encourage regulators to look first at a segmentation of remedies"(Cable Europe, 2008).

A crucial question is the definition of the threshold of homogeneity of the competitive conditions that would make either sub-national geographical segmentation or differentiation of remedies within a national market most relevant. For example, the French regulator, ARCEP, concluded from its 2008 market assessment that a national market existed, in particular because the differences in competitive conditions

between the zones were not sufficiently pronounced. ARCEP pointed out that since the areas with local loop unbundling were continuing to expand, the adoption of geographical markets would contribute towards containment rather than expansion of unbundling. This expansion is favoured in particular by the implementation of bitstream in the market through a combination of tariff obligations (*e.g.* cost-based tariffs) according to the competitive circumstances that exist in a geographical region as a result of the unbundling.

1.5 Rationale for *ex ante* access regulation

The aim of *ex ante* access regulation is to create conditions for improved competition by removing barriers to entry in an upstream or downstream market that inhibit competition in that market or other markets. Access regulation is intended to promote either service-based or facilities-based competition. However, facilities-based competition is generally considered to be necessary for long-term efficiency because it is conducive to sustainable competition and innovation; service-based competition is regarded as a stepping stone to facilities-based competition. Some countries, such as France, believe that it might be necessary to have at the same time as infrastructure competition, service-based competition *e.g.*, in order to avoid vertical tight oligopolies. For instance, many countries have made efforts to install MVNO mobile operators even where there exist three, four or even five network operators.

Regulation 2 of the European Communities (Electronic Communications Networks and Services) (Access) Regulations 2003 ("the Access Regulations") defines access as follows:

> "access" means the making available of facilities, services or both facilities and services, to another undertaking, under defined conditions, on either an exclusive or non-exclusive basis, for the purpose of providing electronic communications services. It covers, inter alia, access to network elements and associated facilities, which may involve the connection of equipment, by fixed or non-fixed means (in particular this includes access to the local loop and to facilities and services necessary to provide services over the local loop), access to physical infrastructure including buildings, ducts and masts, access to relevant software systems including operational support systems, access to number translation or systems offering equivalent functionality access to fixed and mobile networks, in particular for roaming, access to conditional access systems for digital television services, access to virtual network services; access does not include, apply or refer to access by end users;"

The rationale of *ex ante* regulation is that *ex post* regulation on the basis of general competition law is insufficient to address market failure or achieve policy objectives. Shifting *ex ante* regulation to the wholesale layer enables a "narrowing of the regulatory footprint" and allows risk-bearing contracts that would be difficult to impose on small end-users, while simultaneously protecting end-users through the provision of competition (Vogelsang 2002).

Enduring bottlenecks. In regard to telecommunications supply, it is commonly considered that *ex ante* regulation should focus on those elements that are 'essential facilities' or 'enduring bottlenecks'. In this context, an enduring bottleneck is defined to mean a network element or facility that exhibits natural monopoly characteristics and is 'essential' to the ability to provide services to end-users in downstream markets in a way that promotes the long-term interest of end-users. Ofcom (2006) in its *Strategic Review of Telecommunications* defines an "enduring economic bottleneck" as the part of a network where the economics of alternative offerings are such that competition, through further market entry or innovation, is very unlikely to emerge in the relevant time horizon. That is, duplication of the network element would result in a loss of efficiency greater than any competitive gains that duplication might achieve. An enduring bottleneck may also arise in circumstances where an access seeker must purchase access to a particular service in order to ensure the any-to-any connectivity of its service to end-users.

Ex post regulation on the basis of general competition law. The removal of *ex ante* regulation facilitated by geographically segmented regulation does not mean that particular services/markets will become wholly 'unregulated'. Where necessary, e*x post* provisions, based on general competition law, could be used.

1.6 Costs of regulation

The aim of regulated access is to prevent the incumbent from abusing a dominant market position. But it is widely recognised that regulation may have attendant costs. For instance, it can constrain a service provider's flexibility and may reduce incentives for cost reduction, investment and innovation. Some argue that even if perfectly executed, regulation imposes transaction, compliance and administrative costs. But even with the best intent and skilful execution, there is inevitably an element of regulatory error which also imposes costs. On the other hand, no regulation or premature deregulation involves exposure to risks that a dominant operator will engage in anti-competitive conduct that distorts the market, impedes competition and results in various inefficiencies detrimental to the long-term interests of end-users. Thus the regulatory challenge in many decisions, such as whether to use geographically segmented regulation to facilitate withdrawal of *ex ante* access regulation, is to strike a balance between such competing concerns.

SECTION 2. MARKET ANALYSIS

The analyses underpinning the regulation of the various service markets, include three basic steps (ERG,2008a):

i) The definition of relevant markets suitable to national circumstances (market definition)

ii) An analysis of the relevant market in order to establish whether a given market is effectively competitive and to identify any undertakings with significant market power (SMP operators) on that market (assessment of significant market power); and

iii) The imposition of appropriate *ex-ante* remedies to correct/avoid possible market failures due to dominant positions.

2.1 Market analysis

Most market analyses conducted by regulators have identified markets on a national 'averaged' price basis since the incumbent operator is the only telecommunications carrier supplying a range of services through an ubiquitous network. The average uniform price across the nation was, in most cases, determined when the telecommunication market was a monopoly, and the use of 'national' market definitions was used because the monopoly had national coverage. As noted earlier, however, there is now increasing debate (ERG, 2008b) over whether this national perspective remains appropriate where competition varies significantly between different geographic areas. But when is there sufficient variation in competitive conditions to warrant a variation in market definition by geographic area? What practical guidelines can be provided on how to evaluate qualifying conditions for such geographic segmentation?

The European Regulators Group (ERG) has proposed guidelines to assist a national regulatory authority (NRA) in analysing circumstances under which a geographically disaggregated approach is warranted (ERG, 2008c). Analysis of geographic markets should follow the same principles as other markets defined according to the principles of competition law and be in line with the EC's Recommendation on relevant markets and the guidelines for assessing Significant Market Power (SMP Guidelines). If an SMP position is found, appropriate remedies will be imposed in line with the ERG common position on remedies (ERG 2006c). On the other hand, if effective competition is found, no obligations can be imposed.

Figure 2 shows a flow chart indicating the steps that the ERG (2008a) suggests a NRA should take in conducting a market analysis to support decisions concerning geographically segmented regulation. The ERG suggests that NRAs first prepare a preliminary assessment of whether a national market seems to be an appropriate unit of analysis. Indicators of this are:

- When the hypothetical monopolist test suggests sufficient demand- and/or supply-side substitution between different areas
- When competitive conditions are sufficiently homogenous such that:
  - Alternative networks either have small coverage and market shares or have (close to) national coverage with similar prices

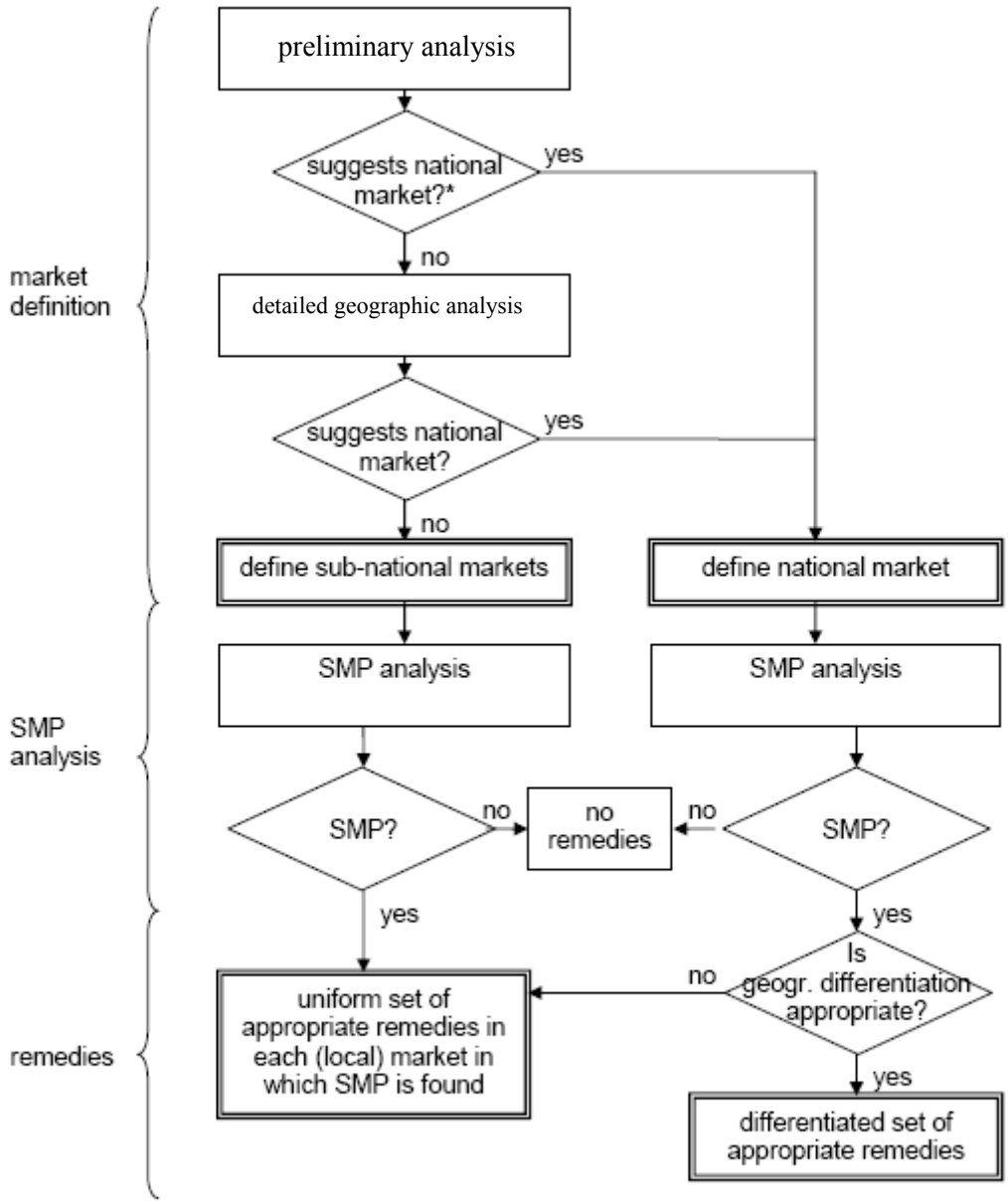
- There is a uniform price levied by the incumbent operator and similar prices of alternative operators
- There are no significant geographic differences in product characteristics.

On the other hand, if the preliminary analysis shows strong indications that sub-national markets with heterogeneous competitive conditions exist, a detailed geographic analysis would be warranted. The ERG suggests (ERG, 2008c) that the detailed geographic analysis should proceed in two steps:

i) Choose an appropriate geographic unit of analysis; and

ii) Assess the homogeneity of competitive conditions.

Figure 2. Flow Chart of ERG Approach to Market Definition



* National market here refers to a market of the size of the network of the incumbent operator.

Source: ERG (2008a), Common Position on Geographic Aspects of Market Analysis (definition and remedies). October.

2.2 Choosing an appropriate geographic unit

ERG (2008a) suggests that there are two main options for determining an appropriate geographic unit upon which to base detailed analysis, namely:

- Political or administrative boundaries (*e.g.* postcodes, political districts or communities)[6]; and
- The network structure of the incumbent operator or possibly alternative operators with sufficient coverage (*e.g.* local exchange areas).

The boundary of a market is determined by identifying constraints on price-setting behaviour including demand-side and supply-side substitution as a result of a price increase.

Geographic demand-side substitution

The issue here is whether the purchaser of wholesale access services would switch demand to another geographic area if faced with a SSNIP (small but significant non-transitory increase in price – a standard economic tool used in market definition) by a hypothetical monopolist, to the extent that it would make the SSNIP unprofitable. If so, then this geographic area should be grouped with the original area being considered in defining the relevant market.

A consumer is unlikely to move to another geographic area due to a price increase (or degradation of quality) since the cost of re-location will probably far outweigh any saving made on fixed-line services. Hence, geographic demand-side substitution is usually a weak constraint so that if this approach were pursued it would lead to very narrow markets being defined that would be impractical to analyse.

In the United States, relevant geographic markets are defined by looking at the demand side. For administrative convenience, regulators then might aggregate relevant geographic markets that face the same competitive conditions.

Geographic supply-side substitution

The issue here is whether a supplier of wholesale access operating in one geographic area would begin supplying in another geographic area if this other area were exposed to a SSNIP by a hypothetical monopolist. If the SSNIP would be unprofitable, then these geographic areas should be grouped together.

In communications markets, geographic supply-side substitution is generally considered to be a weak constraint due to the high cost and long lead times associated with deploying new network infrastructure.[7]

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6. The political, administrative or postal code boundaries usually have little relevance to the sub-geographic telecommunication market or local exchange area of an operator so that their use in determining the relevant sub-geographic markets which are considered as competitive is likely to have a distortionary effect.

7. In identifying close substitutes of the relevant geographic region, the following types of information are typically considered:

   - The costs to customers of obtaining supply from alternative regions
   - Any limitations on the ability of customers to access alternative sources of supply in alternative regions
   - The costs of extending or switching production and distribution systems to supply the customers in alternative regions
   - Any regulatory or other practical constraints on suppliers selling to alternative regions
   - Records relating to trade flows and the actual movement of customers and/or suppliers between geographic regions, especially related to changes in relative prices across regions in the recent past
   - Views and business records of buyers and suppliers regarding the likelihood of switching between geographic sources of supply; and
   - Relative price levels and price movements of different geographic sources of supply.

For example, the nature of fixed-line networks, including the sunk and lumpy characteristics of investment and the long lead times often involved in deployment, suggests that rivals may have limited scope to quickly re-deploy supply to geographic areas in response to a non-transitory price increase, or the degradation of quality (Amendola and Pupillo 2008).

Choosing an appropriate geographic unit with the onset of next generation access networks

Ofcom (2007a) considers that in the context of assessing differences in competitive conditions in the wholesale broadband access market that the use of the local exchange as the reference geographic unit strikes a reasonable balance in the trade-off between 'granularity' and 'practicality'. This approach is also considered to be consistent with the current competitive landscape since LLU is provided at the local exchange level. Accordingly, variations in competitive conditions can be observed at the local exchange level. This suggests that individual exchanges with similar competitive conditions can be grouped and then addressed with the same regulatory tools.

ERG (2008a) suggests that the choice of an appropriate geographic unit may differ between markets. For example, for fixed network access or wholesale broadband access markets, the appropriate unit may be an MDF site or a street cabinet, whereas for trunk segments of leased lines it may be a connection between geographic points such as cities or communities. Where a forward-looking perspective is adopted, this introduces the need to consider how current competitive conditions may change because of technological developments. For instance, if the transition to NGA introduces an additional difficulty into the choice of geographic unit since with the deployment of NGA, unbundling at the street cabinet is likely to become uneconomic and as such would not be the appropriate geographic unit. NGA poses additional difficulties to market definitions especially regarding the stability of market boundaries and the appropriate geographic unit: the network topology changes with NGA and the number of local exchanges reduces by comparison with the legacy network. This issue is discussed further in Section 7 of this paper where the implications of geographic segmented regulation for an NGA environment are discussed.

2.3 Aggregating geographic units by identifying 'similar' competitive units

An important consideration is the basis upon which different geographic areas will be aggregated because they have 'similar' competitive conditions and therefore could warrant a similar regulatory approach. The range of possible indicators that, in principle, could be used to aggregate exchange areas includes (ERG 2008a):

- Structural factors such as the number of facilities-based competitors that operate in a local exchange (*e.g.* if there are 3 or more, these local exchanges would be considered a separate market from those where there are two or less)
- Population density thresholds (*e.g.* if there are 10 000 or more customers connected to a local exchange, these could be considered a separate market from those where there are less than 10 000 customers); and/or
- Evidence of price discrimination or price correlation between different geographic regions (*e.g.* if there is evidence that an operator consistently offers different prices for homogeneous services across different local exchange areas, this may be an indication of geographic market boundaries).

The ERG (2008c) suggests an approach that combines the number of operators with market shares and factors indicating scale economies (such as households covered) or uniformity of prices. But it is recognised that such factors risk being arbitrary and risk leading to errors of judgement. For example, the presence of 3-4 operators in a LLU site does not by itself mean that other operators have access to wholesale services in that specific site. This is because the operators present in a local exchange may not

be able to offer wholesale services for technical (*e.g.*, limited collocation space) or economic (economies of scale and scope do not justify the introduction of wholesale operations) reasons. Also, the unbundled local loop operators present in a single site may simply not have the organization or resources required to offer wholesale services (*e.g.*, the staff, billing systems, support systems, operational systems, procedures, etc). Indeed, in many countries, few if any alternative operators are likely to have this ability since their main focus are retail customers. This is a reason why – as discussed later – the number of operators in a market is no assurance that competitive conditions exist in the sense of an availability of alternative sources of wholesale broadband access services, etc. However, to the extent that there is effective competition at the retail level through self provision of wholesale inputs by vertically integrated operators, then the lack of availability of alternative sources of wholesale broadband access services should not be of concern to regulators.

The ERG (2008c) puts forward a range of criteria to assess the homogeneity of competitive conditions across geographic units chosen by the NRA and these are summarised in Box 1. The task of identifying homogeneous geographic units turns out to be a complex one and unavoidably dependent to some extent on subjective judgements, like many economic market definition exercises. As Section 3 discusses, the experience of OECD countries that have implemented geographic regulation confirms the complexity of the task.

Box 1. Indicators to assess homogeneity of competitive conditions

Criteria	ERG explanation
Barriers to entry	■ Alternative operators usually first enter areas where barriers to entry are low. Consequently there is more competition in these areas. ■ In communications markets, barriers to entry are usually related to economies of scale and sunk costs. ■ Economies of scale can be more easily realised if there is more demand. Therefore, NRAs should take into account such factors as total income, household density, business site density or mobile phone base station density (representing demand for leased lines of mobile phone networks operators).
Number of suppliers	■ This criterion has the advantage that it can usually be easily observed. In addition, it is not based on an abstract analysis but shows how entry barriers are actually perceived by operators. ■ Competitive conditions may not only differ in terms of the number of operators but may also be related to their size. Therefore, it may be appropriate to focus on large operators which exert a significant competitive constraint on the incumbent operator.
Market shares	■ Assessment of the variation in local market shares and their development across different geographic areas would account more explicitly for the relative size of operators. ■ Usually it would suffice to consider two points in time to draw assumptions about trends in market shares.
Prices	■ A geographically differentiated price of the incumbent operator can be an indicator of significant differences in competitive conditions. ■ A nationally uniform price can be an indicator of a national market, but large price differences between the incumbent operator's national price and the price of alternative operators in the areas where they are present may indicate differences in competitive conditions. ■ However, if the national uniform price was the result of a SMP obligation in the market which is being investigated, the 'modified greenfield approach' would require an analysis of the situation without this obligation.
Other criteria	■ Other criteria which might be looked at include geographic differences in marketing sales/strategies, quality/functionality of the product or the nature of demand.

Source: ERG, Common Position on Geographic Aspects of Market Analysis (definition and remedies), October, 2008.

Pricing and price differences

While geographic differences in prices are an important criterion for defining a market it is not always clear how to assess this factor. It is sometimes argued that a national uniform price levied by the incumbent operator would imply a national market. However, although this might be correct in some cases, there may be other cases where, from a consumer perspective, significant differences exist between "competitive" and "non-competitive" areas despite a national uniform price charged by the incumbent operator. Also a national uniform price is not a useful indicator for a national market if it is imposed as the result of an SMP finding. Moreover, if an access provider prices its products on a 'national' basis, this may not necessarily indicate that different competitive environments do not exist but simply that the benefits of instituting a national price (*e.g.*, cost savings in advertising, decreased potential confusion for customers or greater ease in training sales staff) outweigh any potential costs of raising prices in that region. On the other hand, if the incumbent operator has not set a uniform price this could be a strong indicator of differences in competitive conditions (with competitive constraints stronger in those areas where prices are lower). But differences in prices could also be reflecting differences in costs. Accordingly, where geographic differences in prices are observed, there would be a need to consider whether they reflect differences in costs and/or differences in competitive conditions. For instance, in Finland, where the fixed line markets are characterised by about 30 local/regional operators with significant market power, differences in the regulated prices have been approved if differences in costs are identified.

Technology neutrality

Another complication regarding geographic regulation relates to technology neutrality. Each technology has a different geographic footprint and therefore market and this may lead to problems in terms of technology neutrality when different technologies which are substitutes are regulated differently under a geographic regulation regime. For instance, the fixed market may be regulated on a segmented basis whereas the mobile market may be regulated on a national basis and this could impact on the relative substitutability between the services. Mobile operators can offer fixed-mobile converging services by using unbundling and/or bitstream offers. Where deregulated fixed line operators are not obliged to provide such offers, or the terms of offers vary between regions, this could result in distortions to competition (ERG, 2009).

It is important that the regulatory regime does not distort the use of any technologies or platforms in the delivery of services to end users. In a convergent environment, allowing services to be made available from a range of networks is critical to sustaining investment and innovation and thereby maximising choice and benefits to residential and business consumers.

2.4 Defining sub-national segmented geographic markets or differentiating remedies in a single national market

Where the available evidence suggests that the scope of the relevant market is national, market power is assessed within this national market. If the market analysis suggests that the geographic scope of the relevant market is sub-national, then the regulator needs to assess market power in each separate market and impose appropriate remedies to address SMP where this is identified.

As noted earlier, competitive conditions may vary within a national geographic market, but not to the extent warranting the definition of sub-national markets. ERG (2008a) suggests that in this case it may be appropriate to geographically differentiate the remedies that will be imposed on the operator designated as having SMP in the national market:

"Where the available evidence suggests that the scope of the relevant market is national, again market power will be assessed within this national market. However, within a national market it could be the case that there exist geographic variations in competitive conditions, but that any differences in the conditions of competition between geographic areas are not yet sufficiently stable or sustainable to justify the definition of regional or local markets. In such circumstances it may be appropriate to vary remedies within that national market where an operator is found to have SMP."

Although ERG (2008a) emphasises that the geographic segmentation of markets and the geographic differentiation of remedies should not be viewed as two alternative equally applicable options, there are concerns that the definition of a threshold between sub-national geographically segmented regulation and conditions warranting the differentiation of remedies within a national market is not yet sufficiently clear. This lack of clarity could give rise to somewhat arbitrary decisions by national regulators. Thus, there is a risk that in practice, regulatory authorities may have undue discretion to use one or the other as they judge appropriate. However, ERG (2008c), if followed by regulators, should go some way towards reducing this uncertainty and level of discretion. Further guidance enabling precise specification of the conditions for use of each of the two different approaches would be useful. This could emerge over time as regulators continue to make decisions in this area.

An option that some countries have put forward is the possibility to distinguish between each of the following scenarios: (*i*) situations where a regulator conducts a separate competitive analysis for discrete sub-national geographic areas and adopts rules tailored to each of those areas; *(ii*) situations where a regulator concludes that, in general, competitive conditions are the same throughout the country to warrant a default national rule, but provides rules for deviation from the default regulation based on a particular competitive showing; and (*iii*) situations where a regulator concludes that, in general, competitive conditions are the same throughout the country to warrant a national rule, but permit requests for forbearance from the national rule based on competitive evidence regarding a narrower geographic market. These different scenarios might illustrate different ways in which regulators have balanced economic or analytical rigour (and associated complexity) in defining and analysing markets vs. administrability or other practical concerns, for example. Alternatively, one might forgo drawing any distinctions and consider all types of geographically segmented regulation together, regardless of how it is achieved.

Some countries have raised the issue that sub-national market definition and remedy differentiation between geographical areas are not always regulatory alternatives, as they can be the consequences of the results found on different phases in market analysis. Therefore there is a need to try to identify:

- The characteristics of cases where geographic segmentation should be rejected;
- The characteristics of cases where geographic segmentation should be adopted; and
- Those where the situation is not so clear, so a regulator might use its discretionary power to decide, taking into account other factors (*e.g.*, the extent to which the regulator will be able to review or even withdraw the decision if it turns out to be ineffective, or because of the potential impact of the decision on other regulatory areas).

SECTION 3. OECD COUNTRIES APPLYING GEOGRAPHICALLY SEGMENTED REGULATION

3.1 Examples of OECD countries applying sub-national geographic segmentation

A number of OECD countries have in fact already conducted market analyses in order to apply geographically disaggregated regulation. This section examines the approaches used and what can be gleaned from this experience about the efficacy of geographically segmented regulation. What becomes clear from this examination of geographically segmented regulation in practice is the complexity of the task and the element of subjectivity/judgement in making choices at a number of points in the geographic regulation process that could increase the unpredictability of the regulatory regime.

United Kingdom

Under EC telecommunications rules, national regulators assessing an operator to have SMP in markets such as LLU (the EC's "market 4"[8]) and WBA (the EC's "market 5"[9]) must impose appropriate *ex ante* regulatory obligations. Conversely, an operator may ask an NRA to withdraw regulation under a mechanism provided by the EC Framework Directive -- the so-called Article 7 procedure.[10] In November 2007, Ofcom was the first regulator in the EU to define sub-national geographic markets for wholesale broadband access[11] (WBA)[12] and found that the incumbent did not have Significant Market Power in one of the defined local markets. The underlying reason why Ofcom defined the scope of this market was not with any policy aim of deregulation, but in line with Ofcom's requirement under the EU Regulatory Framework to conduct periodic market reviews in a manner consistent with competition law. The market to be deregulated covered 65% of UK homes and businesses. Similarly, following its leased lines market review (Ofcom 2008) in 2008, Ofcom again notified to the EC a proposal to define sub-national markets and a relaxation of *ex ante* regulation in the most competitive areas of these markets, notably in the densely populated Central and East London Area.

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8. The EC's Market 4 refers to wholesale (physical) network infrastructure access (including shared or fully unbundled access) at a fixed location.

9. The EC's Market 5 refers to Wholesale Broadband Access. This market comprises non-physical or virtual network access including 'bit-stream' access at a fixed location. This market is situated downstream from the physical access covered by market 4, in that wholesale broadband access can be constructed using this input combined with other elements. European Commission (2007), Commission Recommendations on relevant products and service markets. C(2007) 5406 rev 1.IP/07/1678

10. For more information see: http://ec.europa.eu/information_society/policy/ecomm/implementation_enforcement/article_7/index_en.htm

11. Wholesale broadband access (or bitstream access) is, together with access to the local loop (local loop unbundling, or LLU), a key input enabling alternative operators to enter the retail market and to offer broadband services to consumers.

12. However, it is pertinent to note that this followed the functional separation of BT so that in fact there was a separate layer of regulation in place which ensured equivalent access to all new entrants on a nondiscriminatory basis. Ofcom (2007c).

Ofcom's approach to geographic market analysis includes:

- SSNIP analysis involving the analysis of demand-side and supply-side substitutability, and the hypothetical monopolist test

- Analysis of pricing constraints and buying patterns that examine whether the geographic coverage of a market might be extended by the existence of common pricing constraints, or by the purchasing behaviour of end-users; and

- Assessment of competitive conditions that examine the extent to which other indicators of competitive conditions vary by geography, and whether different geographic areas could be grouped together on this basis.

In both of these market reviews, Ofcom concluded that for the purpose of identifying relevant geographic markets, the SSNIP framework was not particularly informative. For instance, because of the high costs of relocating, it is unlikely that a customer would move house in response to a price increase of 5% or 10% in the area where they currently live. Hence the use of an SSNIP criterion would result in very narrow markets (*i.e.,* at the level of a household or a business premise) unlikely to be representative of the differences in competitive constraints prevailing in the market (Ofcom, 2008a).

Ofcom's choice of appropriate geographic unit of analysis. Ofcom, in its review of the wholesale broadband access market, chose to use BT's local exchanges because it considered that this is where wholesale broadband access supply substitution takes place, due to the availability of the upstream regulated LLU product. Moreover, Ofcom noted that BT had begun to geographically de-average its wholesale broadband prices at the level of individual exchanges in response to LLU-based competition. Ofcom acknowledged, however, that based solely on supply considerations, each of the exchanges would be a separate relevant geographic market. In order to avoid defining such narrow markets, there was need to aggregate geographic units into geographic markets based on the concept of "similar competitive conditions"(Ofcom, 2008a).

Aggregating geographic units. After reviewing the suitability of a number of indicators, Ofcom chose to do this on the basis of:

- The number of actual operators present in an exchange – where only operators with at least 10% national coverage are considered in order to exclude niche operators
- The number of operators planning to enter an exchange – as specified by the LLU rollout plans submitted to Ofcom
- The size of the exchange in terms of number of premises – as a proxy for economies of scale and therefore the likelihood that forecast entry in an exchange will be viable in the long run.

Then – applying the indicators described above – geographic units were aggregated into markets with sufficiently homogeneous competitive conditions.[13] This led Ofcom to identify (Ofcom 2008b) the following sub-national geographically segmented markets:

> **Hull** - Local exchanges where Kingston Communications is the only operator (0.7% of UK premises).

13. Ofcom (2007c) discusses how analysis of this issue can include: (*i)* statistical analysis techniques such as regression and cluster analysis that can be used to explain and predict the scope for competition in different areas; (*ii*) the number of suppliers who currently have a presence in the area; and (*iii*) service shares. Ofcom noted, however, that each of these approaches had potential deficiencies.

Market 1 - Local exchange areas where only British Telecom is present (16.4% of UK premises).
Market 2 - Local exchange areas with 2 or 3 wholesale providers and forecasts for 4 or more, but where the exchange serves less than 10,000 premises (13.7% of U.K. premises).
Market 3 - Local exchange areas with 4 or more wholesale providers and forecasts for 4 or more, but where the exchange serves more than 10 000 premises (69.2% of UK premises).

Ofcom argued that as a result of the regulation of relevant wholesale inputs (LLU and bitstream), broadband competition is developing in the United Kingdom with alternative providers increasingly investing in their own networks and building out to connect to the incumbent's local loop. This had resulted in differing conditions of competition across the United Kingdom suggesting that a national market no longer exists (Ofcom 2008a).

Remedies

Under the EC's regulatory framework, if any operator is found to have SMP in a particular market, the regulator has to consider what regulatory remedies it should impose in order to address potential anti-competitive behaviour, prevent abuse of SMP and/or promote competition. Although similar remedies can be imposed in multiple separate markets where one or more operators are found to have SMP, each remedy is market specific. This means that if there are separate geographic markets there could potentially be different remedies in each of these markets. Thus, in Market 3 (see above), Ofcom considers that there is effective competition to protect consumer interests and that, after a transition period of one year, regulatory obligations should be withdrawn from this market. However, Ofcom found BT to have SMP in both Market 1 and Market 2 (see above) and proposed the regulatory remedies summarised in Box 2.

The remedies proposed by Ofcom (Ofcom 2007a and Ofcom 2008b) are noteworthy as an example of the regulatory stance that could be adopted towards regions that – as a result of geographic analysis – are found to have ineffective competition.

Box 1. Regulatory remedies

The regulatory obligations that Ofcom proposes to impose on BT in Market 1 and Market 2 (where Ofcom found BT to have SMP) and Ofcom's reasoning for proposing to impose each remedy is set out below.
(i) Requirement to provide Network Access on reasonable request – a provider having SMP might refuse to supply Network Access or meet reasonable requests for Network Access in the absence of a requirement to do so. The absence of supply might restrict competition in downstream markets.
(ii) Requirement not to discriminate unduly – a provider having SMP might have an incentive to offer favourable terms, including price, to its own operations unless it was prevented from doing so. The availability of differing terms might create a barrier to entry.
(iii) Requirement to publish a Reference Offer – a provider having SMP might have little incentive to encourage entry and therefore would be unlikely to set out the basis on which other Communications Providers could obtain service in the absence of a requirement to do so. This might increase the cost of entry into the market and create a barrier to entry.
(iv) Requirement to notify charges, terms and conditions – a provider having SMP might have little incentive to encourage entry and therefore might be unlikely to set out the charges, terms and conditions on which other Communications Providers could obtain service in the absence of a requirement to do so. This might increase the cost of entry because potential entrants might have to enter into negotiations before securing access and create a barrier to entry.
(v) Transparency as to quality of service – a provider having SMP might have little incentive to set out comparable internal and external service quality in the absence of a requirement to do so. This might make it difficult to monitor any potential anti-competitive practices and create a barrier to entry.
(vi) Requirement to publish technical information – a provider having SMP might have little incentive to encourage entry and therefore might be unlikely to set out the technical characteristics of the service or the means of interconnection in the absence of a requirement to do so. This might increase the cost of entry to the market and create a barrier to entry.
(vii) Requirement to account separately – a provider having SMP might have little incentive to set out the internal transfer charges and external charges in the absence of a requirement to do so. This might make it difficult to monitor any potential anti-competitive practices and create a barrier to entry.

Source: Ofcom (2007), Review of the wholesale broadband access markets 2006/07, Identification of relevant markets, assessment of market power and proposed remedies. November, 2007.

EC reaction to Ofcom's proposal to implement geographically segmented regulation in the wholesale broadband access market

In February 2008, the EC supported Ofcom's proposal to define sub-national markets considering that it "represents a reasonable move towards better targeted regulation and exampled the determination to deregulate wherever this can be done in a way consistent with the broader public interest"(EC, 2008). The EC (2008a) commented that Ofcom's analysis would have been clearer if it had defined each of the 5 587 exchanges as a separate relevant geographic wholesale broadband access market. However, the EC recognised the practical difficulties in carrying out a detailed SMP analysis for each of these 5 587 geographic markets. It therefore accepted the general principle that, where there is robust evidence, those exchanges which display similar or sufficiently homogenous conditions of competition can be grouped together in order to carry out the SMP assessment.

The EC argued that the grouping of geographic markets on the basis of the number of competitors present at a given exchange, even in combination with the size of that exchange, is in itself not sufficient. In this respect the distribution of market shares, as well as an analysis of pricing and price differences in the different exchanges, are amongst the essential parameters. Nevertheless the EC considered that Ofcom's proposed withdrawal of regulatory obligations from Market 3 rests on a "sufficiently robust" evidential basis across the range of exchanges in that market. In reaching this conclusion, the EC

recognised that Ofcom is constrained by the need to establish a workable approach in carrying out its market review. Nonetheless the EC invited Ofcom to further substantiate in its final measure its aggregation of geographic "units" in its proposed "markets".

In regard to the definition of sub-national markets, the EC considers that a geographic delineation that is primarily based on the number of operators present in a local exchange is not by itself sufficiently detailed or robust to identify real differences in sustainable competitive conditions for the purpose of market definition. In assessing whether conditions of competition within a geographic area are similar or sufficiently homogeneous, additional structural and behavioural evidence is necessary. Relevant evidence would include information on the distribution of market shares and the evolution of shares over time. In addition, evidence of differentiated retail or wholesale pricing which might apply could help indicate different regional or local competitive pressure as well as the pricing of both the incumbent and alternative operators and its evolution over time in the relevant areas.

The EC pointed out that it is also important that the proposed market boundaries are sufficiently stable to identify the areas where de-regulation could be justified. This may be possible in the case of the broadband access markets where there is evidence of sustainable competition from alternative providers, in particular from LLU-based providers. The EC welcomed Ofcom's commitment to carefully monitor the progress of competition in those areas where regulation will be lifted, and to conduct a further market review should competition not develop as forecast. And the EC underlined the need for Ofcom to closely monitor the overall level of wholesale competition and the provision of wholesale broadband access services in the United Kingdom to ensure that both business and residential users are adequately protected by effective wholesale competition.

These details of the EC's responses to Ofcom's proposal to apply geographic regulation provide an indication of the complexity of the task and the uncertainty of outcomes.

UK leased lines: market definition in the Leased Lines Market Review (LLMR)

In 2006, Ofcom (2006) examined whether there were significant geographic variations in competitive conditions in the various leased lines[14] product markets in the United Kingdom in order to consider whether it could be appropriate to vary remedies on a geographic basis. This was the first occasion that Ofcom looked in as much detail at the issue of how to address geographic variations in competitive conditions. Ofcom in that discussion document concluded (Ofcom 2006) that it might be appropriate to define sub-national markets. These product markets were:

- Retail low bandwidth traditional interface leased lines
- Wholesale low bandwidth TISBO (TI Symmetric Broadband Origination)
- Wholesale high bandwidth TISBO (TI Symmetric Broadband Origination)
- Wholesale very high bandwidth TISBO (TI Symmetric Broadband Origination)
- Wholesale AISBO (AI Symmetric Broadband Origination)
- Wholesale trunk segments.

Ofcom concluded that the evidence is such that it could be appropriate to either define local sub-national geographic markets for these products and then assess market power and apply remedies as

14. Leased lines are telecommunications products usually used by businesses. Unlike the telecommunications networks that residential customers generally use (which have shared capacity), leased lines offer end users dedicated transmission capacity. An example of an end-user that would use a network of leased lines could be a high street bank's network of cash machines terminals. Leased lines support the transmission of voice and of data and data transmission is symmetrical (*i.e.* upload speeds are the same as download speeds).

necessary, or alternatively to vary remedies on a geographic basis, but within a single national market (Ofcom 2006). This degree of discretion is notable since it could contribute significantly to uncertainty in the regulatory system. However, Ofcom points out that at that time, it was seeking to expose the issue of geographic variations in competitive conditions and how this should fit with the market analysis process under the EC regulatory framework and, as such, Ofcom did not have to come to a definitive conclusion on the issue.

Choice of geographical unit

In the case of leased lines, the basic building block Ofcom chose to use in the analysis was the postal sector since this was considered to provide an appropriate balance between practicality and precision for the purposes of statistical analysis. But there has been argument about whether this was appropriate. For instance, BT expressed a strong preference for an approach based on its exchange areas, arguing that alternative methods would be very difficult to apply (Ofcom 2006).

Ofcom's approach to aggregation issues for leased line markets

Ofcom faced a range of questions concerning aggregation, including: How should different geographic areas be grouped together for the purpose of imposing regulations? Is it necessary to have contiguous areas? Should 'islands' of different competitive conditions be avoided? Is the postal sector the correct geographic unit from which to aggregate or would another unit, such as BT exchange areas or council authority boundaries be more appropriate?

To support assessment of the extent to which there is evidence that competitive conditions vary on a geographic basis in the various leased lines markets in the United Kingdom, Ofcom conducted a range of analyses, including collecting data through consumer research, data from leased lines network operators, and data from external published sources. Ofcom used data from two sets of consumer research surveys to inform its assessment, the first conducted amongst large businesses and the second amongst medium sized businesses.

Ofcom sought to collect retail and wholesale data from leased line operators for each relevant leased line product provided in the United Kingdom. This involves around 600 000 retail leased lines and around 1 million customer end points (and considerably more wholesale components). Ofcom also collected data from operators relating to their network points of presence. The data was required to allow Ofcom to conduct various analyses of the extent to which different operators have the ability to provide leased lines services using their own networks, and of the extent to which different operators' shares of the provision of services varies by discrete geographic areas (postal sectors).

Ofcom also used data provided by operators in combination with other publicly available data to assess the extent to which it is possible to group non-contiguous areas together into broader areas in which it could be expected that competitive conditions would be similar. This external data relates to factors that could be considered to be key drivers of demand for retail and wholesale leased lines products, namely data on business site density, household density and mobile base station density.

Ofcom focused its analysis on assessing variations in competitive conditions and behavioural factors, such as the existence of common pricing constraints and buying patterns, as opposed to conducting a SSNIP analysis, which Ofcom considered tends to result in overly narrow geographic markets in the context of leased lines.

Practical considerations

Ofcom concluded that whichever approach is used, it is likely to produce an untidy 'patchwork quilt' of areas, made up of groupings of the 9 598 postal sectors in the United Kingdom. This raised a number of practical issues.

The first issue is that services such as wholesale leased lines will in most cases be used to link locations in different postal sectors. It is therefore necessary to decide how a leased line between a competitive and a non-competitive area should be treated.

The second issue is that the first stage of analysis is likely to group together a number of non-contiguous areas, which may be hundreds of miles apart. In some ways it would seem to be counter-intuitive to define such a collection of postal sectors as a single market. In Ofcom's view, however, the non-contiguous nature of such groupings should not prevent them being referred to as a single market for regulatory purposes, linked together by the similarity of their competitive conditions. Ofcom considered that such an approach would be consistent with the EC guidelines for analysis of markets and SMP, and could provide a practical basis for regulation.

The third issue, related to the second, is that the boundaries between markets are likely to be untidy, and that larger areas within one market are likely to be interspersed with smaller 'islands' in another. There are at least two reasons why this could matter:

- Firstly, it could be confusing for customers if regulatory provisions vary on the basis of geographic market definitions which have little or no meaning from their point of view.

- Secondly, the costs and difficulties of ensuring compliance with regulatory provisions may be considerable if market definitions are based on geographically untidy groupings of areas. The most obvious difficulties concern the availability – or lack of availability – of cost and revenue information at a disaggregated geographic level. Ofcom acknowledged that in this regard an approach based on aggregation of the incumbent's exchange areas had the advantage of being the lowest level at which accounting information is collected by the operator.

Ofcom pointed out that if the issues associated with aggregation prove to be significant, consideration could be given to the use of some simpler options, including: (*i*) administrative boundaries such as the CBD areas, which would be more familiar to customers; (*ii*) groupings of the incumbent's exchange areas, for which accounting information might be more readily available; or (*iii*) other more readily understood areas.

Example of problems in obtaining geographically segmented data: Ofcom's proposal to use national cost data to determine 'charge controls' for leased lines

There are evidently also significant problems in obtaining geographically differentiated data. In a later consultation regarding the regulation of leased lines Ofcom (2008) came to the following conclusion:

> "…we only propose to charge control BT's services in the United Kingdom excluding the Central and East London Area (CELA) and Hull area. We propose to deregulate BT's services in the CELA. This raises issues for our charge control as we need to model the costs in the charge controlled area. However, BT does not currently collect financial data on a geographically differentiated basis to allow us to model the specific costs of serving the regulated area. This means that we need to find an appropriate modelling approach to set a charge control for a part of

the UK only. We propose to address this issue by using BT's national cost data to estimate the base year costs for all regulated services."(Ofcom, 2008b)

Ofcom (2008c) noted that in principle, the preferred option would be to model BT's costs based on actual geographic data for those costs in the CELA [Central and East London Area] and non-CELA areas. However, it was unlikely that robust geographic cost data applicable only to those areas in which the charge control would apply could be obtained in the time available. Such an approach would create a high burden on BT's cost accounting since, in particular, BT would need to identify for each cost component where local variations in unit costs were thought to be likely. Moreover, there would also be need to assess the relative efficiency of BT's costs by geography; and there would be a number of detailed issues regarding the assumptions used to forecast costs (*e.g.* cost volume elasticities) (Ofcom 2008b).

Given such information difficulties, Ofcom considered whether it might instead be appropriate to use national average cost data and seek to apply adjustments to those costs to reflect likely geographic differences in costs. Such adjustments could be based, for example, on an analysis of competitors' costs in the Central and East London Area (CELA) and non-CELA area in order to provide a benchmark for the competitive prices. However, Ofcom considered it unlikely that it could collect sufficiently comparable data from a range of operators for the data to be sufficiently representative. In view of these informational difficulties, Ofcom instead proposed to use as a starting point *national* base year data although it was recognised that this may not capture some geographic differences in costs (Ofcom, 2008b).

What is clear from the preceding discussion of Ofcom's approach and problems faced (including data problems) is the complexity of the task and the element of subjectivity/judgement in making choices at a number of points in the geographic regulation process. The ACCC's experience in Australia discussed below also displays a range of difficulties in principle and in implementation.

Australia

In Australia, particular services may be "declared" [15] for a period not exceeding five years (extendable for a further five years). Once a service has been declared so that it is subject to *ex ante* regulation, the incumbent is required to supply it in accordance with the 'standard access obligations' (SAOs). In July and October 2007, Telstra (the incumbent) lodged a total of six applications with the ACCC seeking exemptions from the obligation to observe the SAOs. One application was in regard to supply of Local Carriage Services (LCS)[16] and Wholesale Line Rental (WLR) in a total of 387 exchanges across Australia selected on the basis that each exchange had, in addition to Telstra, at least one provider of unbundled local loops (LLUs) -- the so-called 'one plus rule'. The second application sought the removal of the PSTN OA regulation in the same 387 exchanges. Telstra (2006) argued that in many urban areas there is significant

15. In Australia, the ACCC has declared the following services (ACCC 2008): Digital Data Access Service (DDAS); Digital Set-Top Unit Service (Foxtel); Integrated Services Digital Network Originating Service (ISDN Originating Service); Integrated Services Digital Network Terminating Service (ISDN Terminating Service); Line sharing service (LSS); Unconditioned local loop service (ULL); Mobile terminating access service; Local carriage service (LCS); Line rental service (wholesale) (WLR); Domestic PSTN terminating access service (PSTN TA)

Domestic PSTN originating access service (PSTN OA); Domestic transmission capacity service. See http://www.accc.gov.au/content/index.phtml/itemld/777921

16. The Local Carriage Service is a service for the carriage of telephone calls from customer equipment at an end-user's premises to separately located customer equipment of an end-user in the same standard zone. www.accc.gov.au

competition in access infrastructure and this competition is increasing over time such that these areas should not be covered by the 'declaration' *i.e*., subject to *ex ante* regulation.(Telstra, 2006).

The ACCC's decision

Telstra's applications for exemption were, in part, successful (ACCC, 2008). The ACCC proposed that exemption from the SAOs for the supply of PSTN OA would apply in 248 out of the 387 ESAs in which Telstra has sought exemption (as part of its PSTN OA Metropolitan Exemption Application) and conditional exemption in all 17 CBD ESAs regarding supply of the PSTN OA in which Telstra sought exemption (as part of its PSTN OA Central Business District (CBD) Exemption Application) (ACCC, 2008b). The exemptions concerning supply of the WLR, LCS and PSTN OA services in 248 metropolitan ESAs were subject to a number of conditions about the access to and availability of the ULLS. Without these conditions, the ACCC would not have been satisfied that granting the exemptions would promote the LTIE.[17]

The ACCC agreed with certain arguments made by Telstra in support of the proposition that reducing reliance on competitors' network assets and related services can lead to more sustainable competition (Telstra, 2007). The ACCC considers that facilities-based competition, including increased LLUS-based competition, is a preferable form of competition to re-sale competition because it has longer-term benefits since it encourages competitors to compete on greater dimensions of supply, such as price and quality, which allows them to dynamically innovate their services. The ACCC pointed out that, in this regard, it is relevant that the LLU is a declared service available on a regulated basis, and for which the ACCC has signalled cost-based prices on a geographically de-averaged basis.[18]

To maximise the prospect that the exemptions are in the long-term interests of end-users, the ACCC imposed several conditions and limitations (ACCC 2008c). The exemptions would not apply to:

a) The supply by Telstra of the LCS or WLR to an access seeker who immediately prior to the commencement of the order used the LSS, LCS and WLR to supply an end-user with a bundled fixed voice and broadband service until such time as Telstra developed and implemented an LSS to LLU migration process that is satisfactory to the ACCC

b) The supply of the LCS or WLR to a queued access seeker, that is, an access seeker who had, prior to the proposed commencement of the orders, applied to Telstra to install a DSLAM in an exchange the subject of the applications (the queuing condition);

c) A capped exchange, potentially capped exchange or a constructively capped exchange (that is, an exchange the subject of the applications in which there was a physical constraint on the installation of an access seeker's DSLAM or where Telstra might require an access seeker to pay for improvements to the exchange to enable access)

d) An exchange where Telstra ceases to supply the LLU; and

17. Australian Government comment in written submission to OECD of 15/12/2009.

18. Australia has different ULL prices for different regions with distinct pricing areas, differentiated ('de-averaged') by the following characteristics: Band 1: Central Business Districts in the 5 mainland state capitals (i.e. excluding central Canberra, Hobart and Darwin); Band 2:Metropolitan areas, with more than 108.4 services in operation in a square kilometre area, which are not in a Band 1 area; Band 3:Regional areas with 6.56 or more, but less than 108.4 services in operation in a square kilometre area; and Band 4:Rural areas with 6.55 or less services in operation in a square kilometre area. ACCC (2002), *Pricing of Unconditioned Local Loop Services (ULLS)*, Final Report, January.

e) The supply of the LCS or WLR provided under an agreement in force at the commencement of the orders (ACCC, 2008a).

The need for these exemptions is noteworthy as another example of the complicated nature of geographically segmented regulation in practice.

A number of access seekers applied to the Australian Competition Tribunal to review the ACCC's decision to grant the exemptions and (in December 2008) the Tribunal "set aside" the ACCC's decision concerning WLR/LCS. Telstra appealed the Tribunal's finding to the Federal Court of Australia which (in March 2009) "set aside" the Tribunal's decision and sent it back to the Tribunal for further review.

The Australian Competition Tribunal finalised the exemption orders on 24 Augut 2009 (in relation to WLR and LCS) and 9 September 2009 (in relation to PSTN OA). On 10 September 2009, the Australian Competition Tribunal confirmed that there is a case for winding back regulated access to Telstra's wholesale voice services in certain metropolitan and CBD areas, when and where competition has sufficiently developed (ACCC 2009). The Tribunal has varied the exemption orders made by the ACCC in August and October 2008 in relation to Telstra's supply of the local carriage service (LCS), wholesale line rental service (WLR) and PSTN originating access service. These services are often acquired together by access seekers to supply voice services to end users.

In its decision, the Tribunal noted that: "…competition is likely to be promoted…if deregulation takes place in a market where … an entrant or small current player has taken, or has the physical capacity and willingness to take, market share from the large or dominant incumbent, by offering end-users a better price product-service package."

Like the ACCC's original exemption orders, the Tribunal's orders address a number of common hurdles faced by access seekers in accessing Telstra's underlying network using the Unconditioned Local Loop Service (ULLS). Under the Tribunal's orders, whether an exemption will apply in a particular area will depend on a number of factors, including the number of Telstra's competitors already using the ULLS in that area as well as their market share. Twice a year, the ACCC will publish on its website a list of geographic areas where the exemptions will apply. No exemptions will come into effect before the end of next year.

The Tribunal also affirmed the ACCC's decision to grant an exemption for the PSTN OA service in five CBD areas subject to a minor variation to the expiry date. The WLR and LCS are not regulated in CBD areas. In line with the Tribunal's exemption orders, Telstra is still required to provide access to the LCS, WLR and PSTN OA services in non-exempt areas and in certain circumstances defined by the conditions and limitations contained in the exemption orders.

This experience with the application of geographic regulation in Australia provides a notable example of the complexity and judgemental nature of decisions regarding geographically segmented regulation and the uncertainty that could result from its use. However, it should also be noted that, in some countries, aspects of regulators' market analyses, including product definitions, have also been subject to appeals with Court judgements overturned.

The ACCC's approach to examining application for exemption from ex ante regulation

The ACCC's approach is similar to that used by Ofcom. In considering whether the granting of exemptions (from *ex ante* regulation) will promote competition, the ACCC undertakes a three-stage analysis:

- First, identify the markets that would be affected by the granting of exemptions;
- Second, assess the state of competition within those markets; and
- Third, assess whether price and service offerings to consumers in those markets are likely to be better with the granting of exemptions (ACCC, 2008c).

In assessing whether the granting of exemptions will promote the Long-term Interests of End-Users (LTIE) objectives, the ACCC considers it useful to apply the 'future with or without' test. Under this approach the current state of competition in the market for both the regulated and downstream services is first assessed. A key issue assessed is the extent to which access seekers can compete in the downstream market for fixed voice services via use of the LLUS in the absence of regulated access to the WLR, LCS and PSTN OA.

Choice of geographic unit

Telstra's (2008) views in this regard are noteworthy. Telstra acknowledged that a potential way to aggregate exchange areas is in relation to those exchange areas where competitors face similar dynamics to market entry such as customer density and costs. However, Telstra (2008) points out that this would require a "subjective analysis" of those characteristics and that the use of such subjective methods is at odds with the importance of a regulatory regime based on objective criteria.

Adding to the uncertainty, some competitive operators have disagreed that the local exchange service is the appropriate geographic unit. For instance, Fastweb (2008) argued that: "…defining a sub-market per local exchange should be avoided for several reasons:

- The geographical area covered by each local exchange is difficult to define;
- The geographical area covered by each local exchange may change over time due to changes in the network architecture of the incumbent and this may change boundaries and competitive conditions; and
- In case not all local exchanges in a certain geographic area (*i.e.*, a metropolitan area) respond to the requisites for segmentation, the availability of differentiated remedies in the same metropolitan area would be impossible to monitor and manage and could cause significant problems for operators operating in that area." (Fastweb 2008, p. 16)

Canada

Under the revised Canadian wholesale regulatory framework (2008) a facility is deemed "essential" if it satisfies all three of the following conditions:

i) The facility is required by competitors as an input for provision of telecommunications services in a relevant downstream market;

ii) The facility is controlled by a firm that possesses upstream market power such that withdrawing mandated access to the facility would likely result in a substantial lessening or prevention of competition in the relevant downstream market; and

iii) It is not practical or feasible for competitors to duplicate the functionality of the facility.[19]

19. Telecom Decision CRTC 2008-17, Ottawa, 3 March 2008 Regulatory policy Revised regulatory framework for wholesale services and definition of essential service, Reference: 8663-C12-200614439.

Certain services could also be classified as "public good" services such as the underlying elements for providing 9-1-1 emergency services and services required for PSTN interconnection. Certain non-essential services could also be mandated on a case-by-case basis as "conditional mandated non-essential". Services which do not satisfy all three of the essentiality conditions or fit within the other regulatory categories should not be subject to *ex ante* regulation. Thus where it can be determined that the conditions no longer prevail for a service currently subject to *ex ante* regulation, the regulation should be withdrawn/forborne. The CRTC notes that there are effectively three possible approaches to conducting such an assessment: market-by-market, by proxy, or service-by-service.

In regard to the regulation of wholesale access services, the CRTC notes that a market-by-market approach would require an examination of each relevant geographic market for each wholesale service at issue. Also, a series of follow-up proceedings and processes would be required to conduct these assessments. The CRTC considers that this approach would be an inefficient and unnecessarily intrusive form of regulation. The CRTC is concerned that a market by market approach would require significant administrative effort on behalf of industry participants, including information gathering, reporting requirements, and additional processes to set accurate proxy thresholds, which would result in further regulatory delays and uncertainty. Thus, the net gains in terms of administrative efficiencies are uncertain.

To minimise the regulatory requirements, the CRTC has made its essentiality findings on a service-by-service basis and applied these findings on a *national basis*. The CRTC considers that this approach is minimally intrusive and administratively simple, and provides the greatest degree of regulatory certainty when compared with the other approaches.[20] That being said, there is some segmentation in terms of pricing for certain access elements. For example, pricing for unbundled local loops (ULLs) differs across different "rate bands", depending on the cost of providing service. ULL prices for Rate Band "A", which characterises the most densely populated urban areas, are relatively low in comparison to Rate Band "E" which includes communities that have no more than 1 500 local telephone lines.

While wholesale regulation is generally applied on a national basis, retail regulation is segmented geographically in several cases. For example, the CRTC has defined the relevant geographical market for high-speed leased line forbearance (speeds of DS-3 and above) as the wire centre (generally, the area served by a central office). Retail local telephone rates forbearance is considered at the geographical level of the local exchange and is described in more detail below.

CRTC regulatory decision 2006-15 as modified by the federal government's Order in Council P.C. 2007-532 specifies criteria for forbearance for business and residential markets.[21] Under the new approach, forbearance with respect to the incumbent's business local exchange services may occur if there is, in addition to the incumbent, at least **one** independent facilities-based, fixed-line telecommunications service provider that offers local exchange business services in the market and is capable of serving at least 75% of the number of business local exchange service lines that the incumbent is capable of serving. With respect to the incumbent's residential local exchange services, forbearance may occur if there are, in addition to the incumbent, at least **two** independent facilities-based telecommunications service providers, each of which offers local exchange residential services in the market and is capable of serving at least 75% of the number of residential local exchange service lines that the incumbent is capable of serving; at least one of these providers, in addition to the incumbent, must be a fixed-line telecommunications service provider.

20. *Ibid*.

21. www.crtc.gc.ca/eng/archive/2006/dt2006-15c.htm

Alternately, the CRTC may forbear if the incumbent can demonstrate that it does not have market power based on the criteria proposed by the Competition Bureau.[22]

The Government recognised that from an end-user's point of view, the presence of competing infrastructure in and of itself is not an indicator of an effectively competitive market. Regulatory forbearance also includes a capability consideration that: "...deregulation will occur where competitors are serving the market and are capable of serving 75% of the number of lines that the incumbent can serve. This will ensure that there is consumer choice."[23]

The CRTC's application of the guiding principles to examine applications for forbearance

In 2007, the CRTC addressed Bell Canada's applications for forbearance from the regulation of residential local exchange services in 58 exchanges. The CRTC noted that information provided by market participants indicated that there was no facilities-based fixed-line telecommunications service provider, other than Bell Canada, offering residential services in 11 of the exchanges. Accordingly, the CRTC determined that these 11 exchanges did not meet the competitor presence test.

The CRTC noted that for 32 exchanges, information provided by Bell Canada and confirmed by competitors indicated that none of the competitors was capable of serving at least 75% of the number of residential local exchange service lines that Bell Canada was capable of serving in each of these exchanges. Accordingly, the CRTC determined that these 32 exchanges did not meet the competitor presence test. In regard to the remaining 15 exchanges, the CRTC noted that Bell Canada submitted that competitors were capable of serving at least 75% of the number of residential local exchange service lines that Bell Canada was capable of serving in these exchanges. The CRTC notes that for 2 of these exchanges, information provided by the parties confirmed that there are, in addition to Bell Canada, at least two independent facilities-based telecommunications service providers, including providers of mobile wireless services. Each of these service providers offered local exchange services in the market and was capable of serving at least 75% of the number of residential local exchange service lines that Bell Canada was capable of serving, and at least one, in addition to Bell Canada, was a facilities-based, fixed-line telecommunications service provider. Accordingly, the CRTC determined that these 2 exchanges met the competitor presence test. The CRTC determined that the remaining exchanges did not meet the competitor presence test, as the other fixed-line telecommunications service providers were not capable of serving at least 75% of the number of residential local exchange service lines that Bell Canada was capable of serving.

To conclude, in September 2007 the CRTC approved Bell Canada's applications for forbearance[24] from the regulation of a number of local exchange services and future services that fell within the definition of local exchange services as they pertain to residential customers in two exchanges only (set out in modified Telecom Decision 2006-15).

The CRTC reviewed dozens of forbearace applications for communities across Canada. As of September 2008, the CRTC had approved local telephone deregulation in a total of 480 residential and 134 local business telephone exchanges. Deregulation was denied for 96 residential exchanges and 276

22. CRTC, Order Varying Telecom Decision 2006-15 P.C. 2007- 0532, www.ic.gc.ca/epic/site/smt-gst.nsf/en/sf08752e.html

23. www.ic.gc.ca/cmb/welcomeic.nsf/261ce500dfcd7259852564820068dc6d/85256a5d006b9720852572b400524ba5!OpenDocument

24. Bell Canada, "Applications for forbearance from the regulation of residential local exchange services", Reference: 8640-B2-200705593, 8640-B2-200706830 and 8640-C12-200706351

business exchanges. Sporadic forbearance applications continued in 2009, but focussed more on smaller communities. As of 30 June 2009, the CRTC forbore from regulating local exchanges representing 77% of all residential lines and 68% of all business lines in Canada.

Finland

In December 2008, Ficora, Finland's telecommunications regulator, notified the European Commission that it proposed to deregulate bitstream access in certain densely populated areas of the country that account for around 35% of all wholesale broadband access in Finland. The EC's response was that Ficora had not provided enough robust evidence to demonstrate that competitive conditions in these areas are really different from those in the rest of Finland, where regulation would stay in place. The EC also expressed doubts about the criteria used to assess SMP and the SMP analysis carried out by Ficora. The EC stated that this assessment should be based on more than theoretical considerations, especially evidence on real market trends and operators' behaviour (European Commission, 2009).

Japan

In Japan, the determination of whether or not the fixed line carrier is dominant is made on the prefectural basis. Additionally, in regard to competitive assessment, the service areas of competitors is taken into consideration. For example, the main competitors for FTTH are electric power companies' affiliated providers, and since the service areas of each provider is fixed, assessment of the market's competitive status is based on consideration of the service area.[25]

Portugal

In December 2008, *Autoridade Nacional de Comunicações* (Anacom) notified the EC of its proposal to deregulate part of the wholesale broadband access market in Portugal where there are at least three operators and a high number of households with access to the cable network, mainly densely populated urban areas like Lisbon or Porto. These areas account for around 61% of all Portuguese broadband lines. Regulation to make sure that new entrants can compete through access to wholesale services would be maintained in all other areas. In January 2009, the EC sent a letter to Anacom approving its geographically segmented deregulation, concluding that Anacom's proposal is a reasonable move towards better targeted regulation but calling for effective regulation in regions where competition problems persist.

25. For further information, see www.soumu.go.jp/main_sosiki/joho_tsusin/eng/pdf/presentation_Interconnection_Japan.pdf and www.soumu.go.jp/main_sosiki/joho_tsusin/eng/presentation/pdf/070410_1.pdf

Article 33 of the Telecommunication Business Act provides (1) For each of the areas specified by an Ordinance of the Ministry of Internal Affairs and Communications, which are determined by dividing the entire district of Japan by usage of telecommunications services and prefectural districts, the Minister for Internal Affairs and Communications may designate transmission line facilities installed by one telecommunications carrier and having the number of telecommunications circuits whose percentage of the total telecommunications circuits of all transmission line facilities of the same kind installed in the area exceeds the percentage specified by an Ordinance of the Ministry.

Article 34 (Interconnection with Category II Designated Telecommunications Facilities) (1) The Minister for Internal Affairs and Communications may designate transmission line facilities installed by one telecommunications carrier whose percentage of the total specified mobile terminal facilities in the same area as the service area exceeds the percentage specified by an Ordinance of the Ministry. The service area is specified at the city, town and village level.

US

In the United States, some national rules provide for regulatory outcomes to vary based on competitive facts about particular geographic areas. For example, given the statutory standard for requiring network unbundling, as interpreted by the courts, a number of the unbundling obligations imposed on incumbent local carriers vary based on particular facts about the wire centre at issue.[26] While the FCC acknowledged that analysis of more granular geographic areas might enable more accurate assessments in particular cases, it found that it was not administrable for the FCC itself to conduct such analyses in this context, and that alternative means of conducting more granular analyses effectively were precluded by prior court interpretations of the relevant statutory provisions.[27]

In the United States, telecommunications carriers have a statutory right to seek forbearance and the right to do so on a geographically disaggregated basis. The FCC is required to forbear from any statutory provision or regulation where it is satisfied that: (*i*) enforcement of the regulation is not necessary to ensure that a carrier's charges or practices are just and reasonable and are not unjustly or unreasonably discriminatory; (*ii*) enforcement of the regulation is not necessary to protect consumers; and (*iii*) forbearance from applying such provision or regulation is consistent with the public interest. In making such determinations, the FCC must also consider whether forbearance will promote competitive market outcomes.[28]The FCC has examined a number of forbearance applications since the forbearance provision was added to the Communications Act in 1996. Courts have held that the FCC has great flexibility in the market analysis it uses when evaluating forbearance requests,[29] and as a result, the FCC has used a range of approaches. In some cases, the FCC has sought to precisely define relevant geographic markets consistent with its traditional market power analysis, and subject to the scope of available data.[30] In other cases, the FCC has departed from that standard, for example by relying on "a broader evaluation of competition" based on "how parties submitted data in that proceeding", rather than based on geographic markets as formally defined under its traditional market power framework.[31]

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26. See generally *Unbundled Access to Network Elements: Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers*, WC Docket No. 04-313, CC Docket No. 01-338, Order on Remand, 20 FCC Rcd 2533 (2004) (Triennial Review Remand Order).

27. See *e.g.*, id. at 2619-20, paras. 155-56.

28. 47 U.S.C. 160(a), (b).

29. See, *e.g.*, *EarthLink, Inc. V. FCC*, 462 F.3d 1, 8 (D.C. Cir 2006) ("On its face, the [forbearance provisions of the] statute impose[] no particular mode of market analysis or level of geographic rigor.").

30. See, *e.g.*, *Petition of Qwest Communications International Inc. for Forbearance from Enforcement of the Commission's Dominant Carrier Rules as They Apply After Section 272 Sunsets, WC Docket No. 05-333. Memorandum Opinion and Order,* 22 FCC Rcd 5207 (2007).

31. *Petition of ACS of Anchorage, Inc. Pursuant to Section 10 of the Communications Act of 1934, as Amended, for Forbearance from Section 251©(3) and 252(d)(I) in the Anchorage Study Area, WC Docket No.05-281, Memorandum Opinion and Order, 22 FCC Rcd 1958, 1966, para. 12 n.41 (2007) (describing the forbearance analysis used in Petition of Qwest Corporation for Forbearance Pursuant to 47 U.S.C. 160© in the Omaha Metropolitan Statistical Area,* WC Docket No. 04-223, Memorandum Opinion and Order, 20 FCC Rcd 19415 (2005)).

3.2 Geographic differentiation of remedies in a single national market

Austria

In its analysis of the wholesale broadband market, the Austrian regulator, TKK, proposed in February 2008 to define a single national market and designate Telekom Austria (TA) as having SMP but differentiate the remedies (European Commission, 2008b).

TKK considered that TA has SMP on a national level but that competition problems arise mainly in areas with a more limited presence of alternative infrastructure operators. TKK emphasized that market share distributions differ between densely populated areas, where several infrastructure operators are competing, and less populated areas, where frequently only TA is present. Furthermore, TKK considered the incentives for access refusal by TA to be less in areas where it competes with other infrastructure-based operators: if TA were to refuse to provide bitstream in those areas, not necessarily all ISPs' retail customers would migrate to TA instead of moving to competitors. TKK consequently proposed to address these differing competitive pressures by differentiating remedies.

TKK defined a national market but proposed to differentiate its remedies geographically on the basis of geographic variations in competitive conditions. For this purpose, TKK would divide the country into two areas based on the following criteria: (*i*) the number of large operators present in the footprint of each of the 1,480 Main Distribution Frames ("MDFs") operated by TA; (*ii*) the customer density of the MDF area; and (*iii*) TA's market share in each of the MDF areas. This led to the following geographic distinction:

- **Area 1:** includes MDF areas where there are 3 or more large operators and where the MDF serves more than 2 500 households and where TA's share is below 50%; and
- **Area 2:** includes all other MDF areas.

Existing obligations on TA pertaining to Area 1 would be removed with the exception of accounting separation which will continue to apply in the whole of the national territory (*i.e.*, in Areas 1 and 2). TKK intends to maintain existing remedies on TA in Area 2 including: access, price control (on a retail minus-basis), non-discrimination, and cost accounting.

When drawing a distinction between different geographic areas, TKK takes a number of factors into account including the level of customer density capable of supporting sustainable entry in a given MDF area, actual or planned entry in individual MDF areas and local market share distributions. Using these indicators, TKK observed differing levels of competitive intensity in different geographic areas and notes that this provides TA with varying incentives to provide wholesale broadband access services - the incentive to provide access being stronger in areas where multiple operators are present and weaker in those areas where fewer competitive alternatives exist.

Notwithstanding the comparatively stronger competitive dynamic in certain more densely populated areas, TKK notes that TA largely continues to apply the same pricing policy at the national level. TKK thus proposes to recognise the observed heterogeneity in competitive conditions via the application of differentiated remedies. In that respect, TKK proposes to reduce regulation in those MDF areas where it observes greater competitive pressure from alternative infrastructure based operators (Area 1) while retaining remedies in those areas subject to fewer competitive constraints (Area 2).

In its response to TKK's proposed approach, the EC drew attention to types of structural and behavioural evidence it considered relevant to assessing geographic variations in competitive conditions for the purposes of defining different geographic markets, namely the distribution and evolution of local

market shares over time as well as the pricing of both incumbent and alternative operators and its evolution over time in the relevant areas. In addition, differences in the functionalities or types of products being offered, the marketing strategies being pursued or the entry conditions in different areas may further reflect regional/local differences in demand and supply conditions for the purposes of geographic market segmentation. It is also important that any proposed market boundaries would be sufficiently stable over time.

The EC notes TKK's observations concerning the geographic variations in competitive conditions in wholesale broadband access services. However, in view of the national pricing by TA, TA's fairly stable market position at the national level and the absence of evidence on the existence of sufficiently established and stable differences in competitive conditions, the EC concluded that TKK's finding of a national geographic market and the imposition of differentiated remedies is based on sufficiently coherent and cogent evidence.

The EC noted that the regulatory framework does not preclude the imposition of different remedies in the same relevant market. 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.

Nevertheless, the EC suggested that TKK continue to monitor the competitive trend in different MDF areas in Austria. Were the market to develop in such a way that there would be evidence of sustained heterogeneous competitive conditions (*e.g.*, at the stage of the next market review) the EC suggested that TKK consider defining sub-national markets.

The OECD has been informed that TKK's decision was subsequently appealed and overturned in the Austrian national courts and that TKK is in the process of re-notifying the EC its revised market analysis.

Spain

In October 2008, the Spanish telecoms regulator, *Comisión del Mercado de las Telecomunicaciones* (CMT) notified the EC of its proposal to provide access to the civil works infrastructure of the incumbent, including its ducts, and to give wholesale broadband access (bitstream) to the local loop of the incumbent (whether based on legacy copper or new fibre rollouts) *but only up to a speed of 30 Mb/s*. At the same time, alternative operators would be able to compete on the basis of a wholesale broadband input while they are progressively rolling out their own Next Generation Access infrastructure. The CMT further proposed to lighten regulation in those areas where alternative operators have rolled out their own infrastructure (cable or local loop unbundling) and where broadband competition has developed (mainly in densely populated regions).

In November 2008, the EC informed the CMT about its concerns regarding the definition of the relevant wholesale broadband access market. In particular, the EC considered that CMT did not present sufficient evidence to support its finding that speeds above 30 Mb/s could be excluded from the market definition. Also, the EC considered that the evidence provided so far by the CMT is not sufficient to justify the inclusion of alternative infrastructures (cable and local loop unbundling) in the market definition. The EC also sought further information from CMT on the geographic scope of the market. The EC informed

CMT that it had serious doubts that the draft measures on the Spanish wholesale broadband access market are compatible with EU law. Notably, the EC said that it is unprecedented that a national regulator proposes to regulate wholesale broadband access only up to a certain speed.

Concluding remarks

In its submission to the ERG consultation on geographic regulation, France Telecom (2008), proposed that the analytical process leading to the implementation of geographically segmented regulation must be very strict and well documented and "the conclusion must be without any ambiguity"(France Telecom, 2008). At the same time it must:

- Stay simple and transparent in order to be predictable and consistent with common sense
- Avoid artificially creating irreversible discontinuity in market conditions, worsening the digital divide and producing circular regulation; and
- Be consistent with market definition in competition law.

Without necessarily endorsing these criteria, it is nevertheless of interest to note that the conclusion reached from an examination of approaches to market analysis used by OECD countries to support decisions regarding sub-national geographically disaggregated regulation is that France Telecom's proposed criteria are not met. In particular, it does not seem that the process is simple, nor conclusions predictable and unambiguous. Indeed, it appears from the foregoing discussion that the processes used to determine specific relevant markets are, at present, contentious and problematic in principle, and complex and subjective in practice. In fact, to such an extent that the ACCC (2008c) acknowledged:

"The ACCC recognises that determining the precise scope of the areas to be covered by the exemptions [from ex ante regulation] has been a finely balanced process and has involved a level of judgement."(ACCC 2008c).

However, market analysis is not always a straightforward task, as demonstrated by the various legal cases around the world, where regulators' and competition authorities' decisions have been challenged in the Courts. However, such testing and challenging of decisions, together with regulatory position papers, such as the ERG's common position (2008c), may result in the analytical and implementation issues relating to geographically segmented regulation becoming clearer and more predictable.

Geographically differentiated remedies, within a national market, ostensibly avoid the difficulties of defining sub-national markets while allowing better targeted regulation. However, in practice, it, too, is likely to be exposed to many of the same difficulties, criticisms and challenges from opposing market participants, giving rise to concerns about the consistency, subjectivity, stability and predictability of the regulatory regime.

SECTION 4. IMPACT OF GEOGRAPHICALLY SEGMENTED REGULATION ON COMPETITION

When the relevant economic markets have been defined (including the geographic scope), the next step in the analysis is an assessment of the state of competition in the relevant markets to assess whether *ex ante* regulation is required or not. This assessment – which should be consistent with SMP evaluation -- is the basis for deciding whether or not to de-regulate certain identified sub-national markets. Importantly, assessment of the state of competition should be sufficiently forward-looking and not limited to an examination of current market conditions and behaviour. Accordingly it should take into account dynamic factors such as the potential for sustainable competition to emerge and the extent to which the threat of entry (or expansion by existing suppliers) constrains pricing and output decisions.

The conclusion of the discussion in this section is that assessing the strength of competition in a market to determine if deregulation is warranted under a geographically segmented regime is a complex task with risks of making wrong/premature decisions. And this in turn means that the deregulation measures would have uncertain outcomes in regard to promotion of competition.

The next section (Section 5) takes this theme a step further and questions whether geographic regulation might even make competitive conditions worse since it may confer scope for an incumbent to engage in anti-competitive pricing conduct such as margin squeeze tactics.

4.1 Would geographically segmented (de)regulation promote competition in the consumer interest?

In considering whether withdrawing *ex ante* regulation through geographical segmentation would promote competition, a key issue is the extent to which access seekers can compete in the downstream market through use of the LLU in the absence of regulated access to wholesale services. Increased LLU-based provision is considered to be in the long-term interest of end-users since, compared with pure resale, it enables competitors to compete in the downstream market on broader dimensions of supply and allows them to provide innovative services, thereby leading to more sustainable dynamically efficient competition. Some countries believe that LLU may be one key issue in particular situations, but facilities-based competition is another, and the relevance of either of those are likely to vary depending upon the service subject to deregulation (shown, for example, by the deregulation of long distance in the United States).

Assessing whether withdrawing *ex ante* regulation in certain geographic areas will promote competition and the interests of end-users is a complex and contentious task. An example of the ambivalence towards geographic regulation was articulated recently by the Australian Competition Tribunal (ACT) when the Tribunal said that it "neither accepts nor rejects" the geographic regulation approach taken by the ACCC. The Tribunal did, however, accept that an exchange-by-exchange analysis may provide information about the actual level of competition in the relevant market for the provision of the relevant service. But the Tribunal recognised the danger in drawing conclusions about the universal long-term effects of conduct when that conduct takes place in only a relatively small geographic market.

As noted earlier, an indication of the contentious nature of the scheme (in principle and application) is provided by the Australian experience. Here, the ACCC's approval in August 2008 of the majority of

Telstra's applications for exemption was reversed by the Australian Competition Tribunal in December 2008 essentially because the Tribunal was not satisfied with the evidence tabled that competition would be promoted. Upon appeal by Telstra to the Federal Court of Australia, the Federal Court in March 2009 "set aside" the Tribunal's decision and sent it back to the Tribunal for further review on the grounds that the Tribunal had not applied the right criteria under the law.[32] In August and September 2009, the Tribunal confirmed that there is a case for winding back regulated access to Telstra's wholesale voice services in certain metropolitan and CBD areas, when and where competition has sufficiently developed (ACCC 2009).

Another example of the difficulty and uncertainty concerning the analysis required for geographic deregulation is provided by recent experience in Finland. In January 2009, the EC informed the Finnish Communications Regulatory Authority (FICORA) of its serious doubts over FICORA's draft regulatory measures on the Finnish wholesale broadband access market (European Commission, 2009). In particular, the EC is concerned that FICORA has not provided enough evidence of differing competitive conditions to justify the proposed deregulation of access to the incumbent operators' broadband networks in certain geographic markets.

The EC considered that FICORA's analysis did not provide evidence of differences in structural and behavioural market conditions between the municipalities concerned and the surrounding areas. The EC also raised concerns about the criteria used to assess SMP as well as the SMP analysis carried out by FICORA. In the EC's view, this assessment should be based on more than theoretical considerations and should provide evidence on market trends and operator behaviour.

4.2 Rules of Thumb criteria used to assess readiness for deregulation

There are considerable complexities and difficulties in assessing a market's readiness for de-regulation and for this reason there are risks of premature de-regulation that need to be considered in moving towards a geographically segmented regulatory regime. An attempt to reduce the complexity of assessing competitive conditions is the use of 'rules of thumb' approaches.

In Australia, Telstra has proposed a 'one plus' decision rule, a rule of thumb it claimed should be applied to determine which exchanges should be exempt from *ex ante* regulation. In short, Telstra claims that the presence of one in-place competitor with access at cost-based prices, that had already demonstrated a capacity to serve the market, demonstrates that there is a constraint on Telstra's retail pricing behaviour. Telstra argues that the existence in a local exchange area of either (*i*) at least one competitor that has established, or is in the process of establishing, a fixed alternative such as LLU-based DSLAMs, HFC cable or a fibre based network; or (*ii*) at least one alternative wireless network, suggests that in this area the customer access bottleneck does not exist.

The regulator in Australia (ACCC) also considers that a rule of thumb could be applied. However, the ACCC considers that a 'three plus' approach - a market can support four competitors (including Telstra) -- is a more appropriate benchmark. Thus, in August 2008, the ACCC decided to grant conditional exemptions to Telstra from *ex ante* regulation in 248 exchanges that had *a)* 14 000 or more addressable SIOs connected to a Telstra exchange via an uninterrupted wire through which an end-user might be provided with an LLU-based service; or *b)* four or more LLU-based competitors (including Telstra) within the exchange (the 'three plus' rule). As noted earlier, without these conditions and limitations, the ACCC would not have been satisfied that the exemptions would promote the LTIE (the long-term interests of end-users).

32. The Federal Court of Australia (2009), Telstra Corporation Limited v Australian Competition Tribunal [2009] FCAFC 23, Sydney, 11 March.

As noted earlier, Ofcom has used somewhat similar criteria to identify the precise geographic boundaries when it geographically segmented and deregulated parts of the UK wholesale broadband access market and wholesale business connectivity markets.

In Canada, when considering retail forbearance with respect to the incumbent's business local exchange services, the criteria applied by the CRTC is that there is, in addition to the incumbent, at least one independent facilities-based, fixed-line telecommunications service provider that offers local exchange business services in the market and is capable of serving at least 75% of the number of business local exchange service lines that the incumbent is capable of serving. For residential markets, at least two service providers in addition to the incumbent are required.[33]

Criticism of the rules of thumb approach

In practice, a regulator will not always be able to define all relevant geographic markets in a rigorous economic sense, particularly if that geographic market is a particular customer location. Compromises may have to be made. The real issue is whether particular compromises are reasonable.

Applying a rule of thumb is convenient, but should be only a preliminary part of the assessment exercise. As Oftel, the previous telecommunications regulator in the United Kingdom observed:

> "Although Oftel would in principle be attracted to the use of [rule of thumb] tests which would simplify the information gathering process as well as provide relatively simple measures which would be understood by the industry at large – it remains sceptical about whether tests can be devised which are not overly simplistic and which do not mask the underlying complexity of competition in a particular market"(Oftel, 1998).

This view is consistent with the EC's comments on rule of thumb tests when it provided its views on Ofcom's assessment of wholesale leased lines in the United Kingdom.[34] The EC indicated that a geographic delineation primarily based on the number of operators present in a given area is not by itself sufficiently detailed or robust to identify real differences in competitive conditions. Entry by one firm, or even by more than one firm, of itself, does not establish that the incumbent is restrained from exercising market power. Instead, a more detailed assessment of the state of actual and potential competition in the market is required prior to the removal of *ex ante* regulation. Ofcom was in agreement with these points made by the EC, acknowledging that it had taken into account a broader set of indicators when assessing geographic variations in competitive conditions, relying on the number of operators only to define the precise geographic market boundaries.

The Australian Competition Tribunal (2008), too, warned against overdependence on a rule of thumb approach arguing that a fixed rule of thumb in the area of deregulation is just a shortcut, a screening device that reveals little about market dynamics over time.[35] The Tribunal argued that, for example, Telstra's 'one plus' rule and the ACCC's 'three plus' rule identify the current number of rivals, but give no indication as to: *a)* how this number of firms eventuated; *b)* whether their presence (market share) in the market is growing or declining; *c)* whether there has been exit over time and, if so, for what reason; *d)* whether end-

33. Bell Canada, "Applications for forbearance from the regulation of residential local exchange services", Reference: 8640-B2-200705593, 8640-B2-200706830 and 8640-C12-200706351

34. European Commission (2008), UK/2008/0747, *Wholesale terminating segments of leased lines in the UK*; UK/2008/0748: Wholesale trunk segments of leased lines in the UK - Comments pursuant to Article 7(3) of Directive 2002/21/EC, March.

35. Australian Competition Tribunal (2008), December. Available at www.austlii.edu.au/au/cases/cth/ACompT/2008/4.html

users attracted to new entrants are increasing; *e)* whether entry was for strategic or indirect purposes designed to influence behaviour elsewhere or to compete in the market (*i.e,* the particular exchange) in question. Nor can a rule of thumb reliably indicate anything about past, present, or importantly for regulatory purposes, likely future behaviour by either incumbents or potential entrants.

In fact, the critical values used in rules of thumb are a matter of judgment. The problem is that entry into the market by one firm, or even by more than one firm, in itself does not establish competitive circumstances. It does not say much about the extent to which the incumbent is either presently restrained or is likely to be restrained by the competitive process in the future, by either the entrant(s) or by further new entrants. Even where there are relatively low costs of entry and few sunk costs, the competitive impact of entry depends on what the entrant does after it has entered, and how the incumbent responds to it. An important issue is whether in case of a removal of *ex ante* regulation *e.g.*, on WBA, on the incumbent operator, there is opportunity for self-supply of wholesale elements or a developed alternative offer of such services by other operators in the same area. For example, the presence of one other operator or indeed three-four other operators in a LLU site does not by itself mean that other operators will have access to alternative wholesale services in that specific site. This is because the LLU operators present in a single site may not have sufficient co-location resources to enable them to offer wholesale services. For instance, in many cases co-location space is limited so that alternative operators may need to reserve it for their own retail customers. Moreover, even if some level of wholesale services were available from other operators in a specific area, the question remains as to whether it would be feasible for a retail operator to buy a 'patchwork' of wholesale services by different providers in different areas. This may not be feasible in practice and, even if it were, the transactions costs of doing so could be prohibitively high.

The Australian Competition Tribunal (2008) argues that it would be useful to formulate a framework that provides a roadmap for considering applications for deregulation and suggests that such a framework[36] would include at least the factors listed in Box 3.

Box 3: Towards a possible framework for considering readiness for sub-national deregulation

(a) the total number of addressable SIOs* in the market;
(b) the number of exchanges in which there is at least one entrant;
(c) the number of entrants;
(d) the total number of addressable SIOs broken down on an exchange by exchange basis in the subject exchanges;
(e) the share of SIOs that the entrants have taken from the incumbent;
(f) the physical capacity and operational willingness of the entrants to take more market share;
(g) the cost and ease of installing new infrastructure; and
(h) the capacity and technology status of each DSLAM in each exchange.

Note: *An SIO (service in operation) refers to the services provided by a telecommunications company.

Source: Australian Competition Tribunal December 2008 available at www.austlii.edu.au/au/cases/cth/-ACompT/2008/4.html

It is well recognised that the rule of thumb approach should constitute only a preliminary part of the analysis of competitive conditions and that a more comprehensive and thorough analysis is required. Nevertheless, from the common use of the approach, there seems a danger that the pressure to simplify the complexity of the task will influence a retreat into an over-dependence on convenient and easily explained rules of thumb measures.

36. The Tribunal's framework for removing regulation was set out in the Tribunal's first decision (December 2008) which was subsequently set aside by the Full Federal Court. Hence there is no requirement that this framework be adopted in future roll-back of regulation.

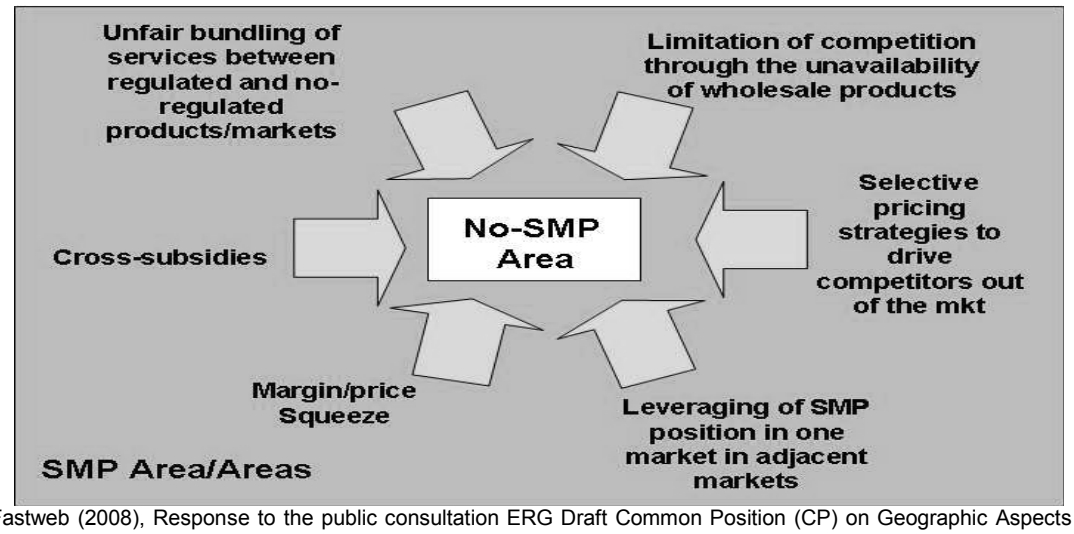
4.3 Implications of geographically segmented regulation for sustainable competition

As noted earlier, a reason for the withdrawal of *ex ante* regulation (facilitated by geographical differentiation) is that it would promote competition, investment and innovation in new technologies and services, improving consumer choice and quality of service and lowering prices. Geographically segmented regulation may enable the benefits of such deregulation to be realised in certain locations, even if the competitive situation would not warrant such deregulation nationally. Regulators could also use geographic segmentation to impose additional regulations in a targeted manner in the specific locations where regulation proves necessary. In either case, this tool can assist regulators to ensure that the regulatory framework they apply is appropriately tailored to the competitive situation. But there are also concerns that a premature withdrawal of *ex ante* regulation can seriously damage competition and consumer welfare, including reversing developments of increased competition in the market. Thus, it is important that regulators accurately determine whether geographically segmented regulation is appropriate.

Figure 3 summarises concerns expressed over a premature removal of *ex ante* regulation on a sub-national geographic basis. They include: unfair bundling and margin squeeze, predatory pricing and cross-subsidisation and refusal to supply wholesale services. Such anti-competitive practices are currently constrained by the imposition of regulatory measures and it is unclear to what extent general competition law can adequately contain these practices if *ex ante* regulation is withdrawn from particular geographic areas. Fastweb (2008) points out that the reason for the existence of the prevailing competition is an important consideration in the decision to forbear. If regulation played a significant role in the development of that competition, then the regulator needs to be confident about the "irreversibility" of competition, that is, that the withdrawal of regulation would not reverse the competitive dynamics (Fastweb, 2008). For instance, the justification for segmenting a market is questionable if the observed competition depends on a regulated upstream input that is under threat of being deregulated. It is for this reason that the EC's Framework requires regulators in EU Member States to adopt a "modified Greenfield" approach to market analysis whereby they conduct their market analysis assuming an absence of regulation at the level of the market being reviewed.

Critics of geographically segmented regulation have questioned whether the removal of *ex ante* regulation based on an assessment of varying competitive conditions in different geographic areas generates a significant risk that an incumbent with the capacity and strong incentives to engage in anti-competitive practices, will be free to do so. There are concerns that the removal - on a geographically segmented basis - of measures that prevent discrimination and anti-competitive behaviour may in fact have the perverse effect of reducing competition in those areas. Thus geographic de-regulation may give rise to the same anti-competitive behaviour that the original nationwide *ex ante* regulations were designed to prevent (Colt Telecommunications, 2008). However, conducting the analysis under a modified Greenfield approach (noted above) could mitigate such risks.

Figure 3. Competition concerns over removal of *ex ante* regulation



Source: Fastweb (2008), Response to the public consultation ERG Draft Common Position (CP) on Geographic Aspects of Market analysis. October.

In deciding whether it is appropriate to deregulate, an important consideration is thus how this would affect the regulator's ability to prevent a reduction of competition, including through the leverage of market power between different geographic areas, in the situation where the regulator no longer has the powers of *ex ante* regulation. This is an important issue since geographic segmentation may increase the risk of cross-subsidies by the incumbent between competitive and non-competitive areas and therefore could result in a reduction of competition in the "competitive areas". For instance, without *ex-ante* regulation preventing discriminatory practices and cross-subsidies, the incumbent may have more scope to apply margin squeeze tactics. (Margin squeeze tactics are considered in the next section of this paper.) Other anti-competitive tactics could be based on non-price product specification and provision and these may be even more difficult to monitor and constrain (Colt Telecommunications, 2006).

SECTION 5. IMPLICATIONS FOR ACCESS PRICING REGULATION

Where the incumbent's network is opened to competitors at more than one level (*e.g.* local loop unbundling, WBA and wholesale line rental), regulators have to correctly design the relative prices of the different options in relation to one another and in relation to the retail prices prevailing in the market. Too low a price at one level may inhibit investment on another level. If a new possibility of market entry is opened up by the regulator, it has to take into account the options which already exist so as to ensure consistency between them.

The relative level of prices for bitstream and LLU can affect an access seeker's decision regarding whether or not to take up LLU at an incumbent's exchange. The LLU price also affects investment, including investment in alternative infrastructure (*i.e.* cable, fixed wireless access, fibre, etc.). If the LLU price is low, the competitiveness of operators with alternative infrastructures could be eroded, as could be incentives to invest further in alternative technologies. However, a high LLU price would deter the take-up of LLU and increase the risk of inefficient duplication of infrastructure.

In general terms, a low price for access encourages use but discourages investment and vice versa. Hence, the debate about access pricing is sometimes characterised as a choice between short-run efficient use of existing infrastructure (short-run static 'allocative' efficiency) and efficient expansion/investment in infrastructure (long-run 'dynamic' efficiency). On the one hand, it is argued that mandating access to existing infrastructure helps in ensuring efficient short-run use of those assets, but can distort long-run investment decisions and hence dynamic efficiency. On the other hand, withdrawing regulation may encourage dynamic efficiency but inhibit efficient use of infrastructure. However, with the right price for access services in place, it is possible that both efficient use and efficient expansion can be pursued (WIK 2008).

This section examines the implications of geographically segmented regulation on price regulation, including:

i) Whether a retail-minus avoidable cost pricing or long run average cost pricing principle should be used?

ii) Whether averaged price or de-averaged pricing should be applied?

iii) How it affects the potential for anti-competitive pricing conduct, in particular margin/price squeeze and cross-subsidisation?

iv) What the implications are for regulated nationally uniform retail prices (which is often an aspect of universal service policy)?

5.1 Cost-based or retail minus access pricing?

There are two main pricing principles for pricing regulated services — the Retail Minus Retail Cost (RMRC) approach and the cost-based approach. RMRC is a so-called 'top-down' approach which takes the retail prices paid for the declared service and deducts the avoidable costs of retailing the service to end-

users to calculate an access price.[37] A cost-based approach, by contrast, is a 'bottom-up' approach which models the costs of the various network elements necessary for use in the service. Regulators in many OECD countries have chosen to apply the Total Service Long Run Incremental Cost (TSLRIC) approach when applying a cost-based pricing methodology.[38] The TSLRIC+ approach includes indirect and overhead costs. If prices are held below costs (which may occur due to a price regulation regime) a RMRC approach will lead to lower access prices than a cost-based approach. If retail prices are above total (wholesale + retail) costs, the access seeker will make some level of economic profit. In this case, an RMRC price will be higher than cost-based prices because it will reflect this level of economic profit. A cost-based approach would not preserve this profit. Thus the relative levels of price and cost are important factors in determining whether a RMRC or cost-based pricing approach is appropriate.

Because of concerns relating to price-squeeze tactics, the relative margin available to competitors between the incumbent's wholesale and retail prices is as important as the absolute level of prices. Some regulators have adopted the retail minus approach in order to help ensure that a sufficient profit margin is available to competitors. For example, in Ireland, ComReg has introduced a retail minus price control approach in which the "minus" element is calculated both as a fixed amount (to reflect fixed retail costs) and as a percentage (to reflect variable retail costs). The percentage varies from 24% to 30%, depending on the wholesale product (ComReg 2008).

In Australia, an access price based on a TSLRIC+ approach has been adopted to date and the ACCC is currently reviewing the approach to measuring TSLRIC+. This is considered (ACCC 2008) to be consistent with the price that would prevail if the access provider faced effective competition[39] and is considered to promote the long-term interests of end users (LTIE) since it would:

- Promote efficient entry and exit in dependent markets since prices are based on long-term costs

37. For an extended analysis of retail minus pricing, see *e.g.*, ERG (2006), *Public Consultation Document on "Principles of implementation and best practice regarding the implementation and use of retail minus pricing as applied to electronic communication activities*. January.

38. TSLRIC has been called LRAIC (Long Run Average Incremental Cost) elsewhere *e.g.*, by the European Commission. Both terms have the same meaning. The TSLRIC+ approach can be better understood by breaking the concept down into the following components:

- 'Total service' refers to the cost of production of an entire service, not to the cost of a particular unit. The cost is usually expressed on a per-unit basis by dividing total costs for the service by the number of units supplied.
- 'Long run' refers to a period where all factors of production can be varied, as opposed to the short run, where the amount of at least one factor of production is fixed.
- 'Incremental costs' refers to the additional costs of supplying the service over and above the situation where the service was not supplied, assuming that the scale of all other production activities remains unchanged. The concept refers to costs which can be attributed solely to the production of the service. In practice, it has been expanded to include indirect and overhead costs (TSLRIC+). See *e.g.*, ACCC (2006), *Local Services Review: Final Decision*, July.

39. TSLRIC measures the incremental or additional cost the firm incurs in the long term in providing the service, assuming all of its other production activities remain unchanged. TSLRIC represents an estimate of the costs that an efficient firm would incur in providing the service over the long run. As mentioned, these costs can be specific to the particular service or include additional costs 'common' to a range of services (i.e. TSLRIC+). Common costs are the costs incurred in the provision of a group of services, which are not avoided unless the production of all services ceases. To estimate costs, a forward looking approach is adopted. Since TSLRIC is a long-run cost measure, the time horizon is sufficient so that all necessary investments can be replaced. Thus, the cost of efficient forward-looking investment in long-lived assets required to produce network services is included in TSLRIC+, even if some or all of the investment will become sunk once in place.

- Encourage economically efficient investment in infrastructure by providing for a normal commercial return on efficient investments in infrastructure
- Provide for the efficient use of infrastructure, as access prices are based on the long-term value of the resources embodied in that service
- Provide incentives for access providers to minimise the costs of providing access by using best-in-use technology compatible with existing network design to measure cost
- Allow efficient access providers to fully recover the costs of producing the service, and promote the legitimate business interests of the access provider; and
- Inhibit the access provider from discriminating in favour of one access seeker over another (unless the 'discrimination' is based on differences in costs).

Where the objective of encouraging efficient 'build-buy' investment decisions is not paramount, use of the TSLRIC+ pricing methodology may be open to challenge. For instance, Europe Economics (2004) concluded that in circumstances where the provision of local copper-based access is expected to remain a monopoly for the foreseeable future, the priorities that ought to drive regulation are different and pricing methodologies such as TSLRIC+ (or LRAIC) are less appropriate.[40]

Geographic regulation and pricing methodology

What the above discussion suggests is that a number of pricing methodologies are relevant when regulating on a national basis. These are likely to also be relevant as a result of geographically segmented regulation. In deregulated densely populated areas where infrastructure is well developed, and its efficient use important and where further investment by the incumbent and its competitors are expected, cost-based pricing methodology could be applied as the basis of price regulation (unless no regulation at all is required). But in areas where investment decisions by competitive operators are less likely to be important, and, indeed, the important consideration is to provide incentives for more investment so as to address inadequate infrastructure development (*e.g.* in rural areas), there has been argument that retail-minus methodologies may be more appropriate. This could lead to variations in regard to price regulation that would add to the already considerable complexity in price regulation. For example, in Australia, as Table 1 indicates, each of the regulated services providing access to Telstra's fixed access network has a different pricing structure.

40. In circumstances in which there is no policy objective to encourage efficient competition in the provision of the local-loop network or when the assets are not replicable (analogous to the situation accepted by authorities regulating other local distribution networks such as those for electricity, gas and water), the key constraint upon regulation is that the network operator should be able to finance its activities and should have an incentive to do so efficiently (including an appropriate structure of charges). This has several consequences.

- First, the incumbent should be allowed to recover the projected necessary operating, maintenance and renewal expenditure requirements of the network.
- Second, for any investment that is required to enhance or expand the network, the operator must be allowed a reasonable opportunity to earn a competitive return on that investment.
- Third, the operator should be able to earn a reasonable return on past investments appropriately valued (which for a privatised business is not necessarily the replacement cost).
- Any historic assets not fully depreciated would enter into the calculation through their depreciation. And if they needed renewing that would be covered under the second point above." Europe Economics (2004), *Pricing Methodologies for Unbundled Access to the Local Loop,* Final Report, p.50.

Table 1. Access services and differing pricing structures

	Pricing Methodology	Averaged or de-averaged prices	Pricing unit	Alternate services	Retail equivalent subject to price control
Local call resale	Retail minus	Averaged	Per call	PSTN OTA (originating or terminating access), LLU	Yes
Unbundled local loop (LLU)	TSLRIC (Total Service Long Run Incremental Cost)	De-averaged	Per line	PSTN OTA, SSS, Local Carriage Service (LCS), Basic Access resale	Yes
PSTN OTA (originating or terminating access)	TSLRIC (Total Service Long Run Incremental Cost)	De-averaged	Per minute	SSS, Local Carriage Service, LLU	Yes
Basic access resale	Retail prices	Averaged	Per service	LLU	Yes
Wholesale ADSL	Essentially retail minus	Averaged	Per service	SSS, LLU	No

Source: Telstra (2007), *Local Carriage Service and Wholesale Line Rental Exemption Applications – Supporting submission to ACCC*, October, p.2.

The various price regulation arrangements applied to the several access mechanisms are striking and are indicative of the different objectives being pursued, including the use of price regulation (*e.g.* price cap regulation) as social policy tools. Geographically segmented regulation is likely to complicate price regulation further with different pricing levels and structures prevailing in different geographical areas. The ERG Common Position (2008c) did not address this subject.

5.2 Averaged or de-averaged access prices?

Because of the regulatory tradition of requiring uniform or averaged prices for retail telecommunications services, the practice of relating prices to costs is sometimes known as 'de-averaging'. Telstra argues that the access price should be set on an averaged basis. Notably, of the EU 15 countries, Finland is the only country which does not use geographic averaging for setting the LLU prices. (This is because there are several local loop operators and therefore, there is a differentiated LLU price for each one.)

The ACCC, however, considers instead that the access price should be set on a de-averaged basis (ACCC, 2007) and as shown in Table 1, in Australia the unbundled local loop price and the PSTN OTA price is set on a de-averaged basis. It is notable that this de-averaging of access pricing at the network access level occurs despite price regulation that promotes averaging of prices at the retail level. There are a number of reasons why the ACCC considers that a de-averaged approach is more efficient: a de-averaged approach is consistent with the ACCC's standard approach to access pricing that relates to the direct costs of service supply and is considered to promote economic efficiency in infrastructure use and investment.

A de-averaged rate for metropolitan areas is likely to be lower than a nationally averaged rate since metropolitan areas have a higher teledensity and, accordingly, are less costly to serve on a per-line basis compared to more sparsely populated areas. Accordingly, the ACCC considers that geographically averaged pricing would be inappropriate.

In Ireland, Eircom's charges for access to LLU are legally required to be cost-oriented (ComReg, 2008). When SMP operators have obligations to offer cost-oriented prices for access to LLU by competing operators, regulators can use different means to set cost-oriented prices[41] such as Long Run Incremental Cost[42].

In the United Kingdom, Ofcom recognises that de-averaged prices could provide better signals for investment decision-making but chooses to use geographically averaged prices for LLU because of "consumer affordability issues and significant practicality issues".

The concern is that although averaged pricing is generally used, a geographically de-averaged approach to pricing is less likely to distort either competitors' build-buy decisions or the incumbent's own investment plans. A national averaged pricing approach, by contrast, is likely to result in inefficient investment decisions with competitors less efficient than the incumbent entering high value customer areas *e.g.* Central Business District (CBD) and certain metropolitan areas. This could lead to an inefficient duplication of the local loop in such areas. On the other hand, on the basis of averaged pricing, competitors may make more use of the incumbent's infrastructure in non-urban areas than is efficient, making smaller investments in their own alternative infrastructure than is cost-effective.

In many regional and remote areas, high-speed services might be appropriately delivered by alternative technologies, such as satellite or newer generation (fixed or mobile) wireless networks. The rationale of cost-based pricing of the unbundled local loop (copper network) in these areas is that it will help ensure that correct incentives are faced for the deployment of appropriate technologies.

5.3 Anti-competitive pricing

In the case of a vertically integrated undertaking with SMP in the wholesale market, a number of competition problems have been identified stemming from the use of the wholesale and/or retail price as a strategic variable. These include:

- Price discrimination
- Cross subsidisation
- Predatory pricing.

41. The ERG Common Position, "Guidelines for implementing the Commission Recommendation C (2005) 3480 on Accounting Separation and Cost Accounting Systems under the regulatory framework for electronic communications" which describes the different methodologies that can be used.

42. Following a review of pricing methodologies, ComReg (2008) concluded that Bottom-Up BU-LRAIC would be the most appropriate cost accounting methodology for Ireland. BU-LRAIC is based on the combination of current costs, BU and FL-LRAIC methodologies, commonly called Bottom-Up LRAIC ("BU LRAIC"). The approach includes, for example, the use of up to date technologies, efficient costs, and assets an efficient operator would purchase to meet current and future demand. For a detailed discussion see ComReg (2008).

A vertically integrated undertaking can pursue a number of strategies to margin squeeze competitors:

i) raise the input price to levels at which rivals could no longer sustain a profit downstream

ii) engage in below cost selling in the downstream market, while maintaining a profit overall through the sale of the upstream input

iii) increase the price of the upstream input and lower the price of the downstream retail product to create a margin between them at which a rival would not be profitable.

With margin squeeze tactics, the key focus is on the *difference* between the upstream and downstream price not on the absolute level of these two prices. Margin squeeze can be applied through: *i*) a discriminatory margin squeeze, when a vertically integrated operator charges its downstream rivals a higher price than it charges its own downstream operation; and *ii*) a non-discriminatory margin squeeze, when a vertically integrated undertaking raises the price of the upstream input both to downstream rivals and its own downstream operation.[43] In assessing margin squeeze, it is irrelevant whether both wholesale and retail prices are regulated or only one of the two. The relevant questions in this context are: *i*) whether the spread between wholesale and retail prices covers the retail costs of the dominant firm; and *ii*) whether the dominant firm is free to avoid the margin squeeze on its own initiative.

Margin squeeze can be caused either by an access charge that is "too high" or by a retail price that is "too low" to allow a sufficient margin for sustainable competitive supply of the downstream service. Thus the scope for margin squeeze could expand if regulation is withdrawn on both access and retail pricing as a consequence of geographically segmented regulation (Stump, 2008b). Accordingly there will be need for vigilance regarding these risks, especially since an operator may be able to use 'bundles' to margin squeeze competitors at the retail level (ERG, 2009). Hence it may be sensible to provide for pricing freedoms resulting from a withdrawal of *ex ante* regulation to be reversed and regulation reinstalled should a market review reveal anti-competitive action, including deliberate margin squeeze.

Geographic deregulation, the threat to uniform pricing and universal service

If WBA prices are cost-based but a uniform retail price exists, this may create a margin squeeze between WBA and the retail price of broadband in a rural market (Stump, 2008b). This suggests that a regulatory authority may need to permit de-averaging of retail prices. But this may have implications for universal service (since uniform pricing is often an aspect of universal service in OECD countries). In short, geographically segmented regulation could further complicate price regulation of not only wholesale access services but also retail end-user services. It may increase the uncertainty and disputation about the use of an appropriate pricing methodology to apply, including whether an averaged or de-averaged cost approach is appropriate.

43. For a detailed discussion of margin squeeze, see ERG (2009), Report on Price Consistency in Upstream Broadband Markets, ERG (09)21, June 2009.

SECTION 6. IMPACT OF GEOGRAPHICALLY SEGMENTED REGULATION ON INVESTMENT

In the context of this paper's focus, the issue regarding investment is essentially whether the withdrawal of regulation in some segments of access markets facilitated by a geographically segmented regime will generate incentives for investment. The issue of incentives for investment in access networks is a critical one, especially since with the onset of NGA substantial further investment will be required. In OECD countries, the access network connects millions of homes and business premises and the investment required is massive and important since it is capable of significantly enhancing the performance of countries that install the right policies. Thus policy and regulation must keep firmly in mind the need to help ensure that such investment is forthcoming and certainly that it is not impeded. This includes vigilance that the approach to mandating and pricing access is appropriate.

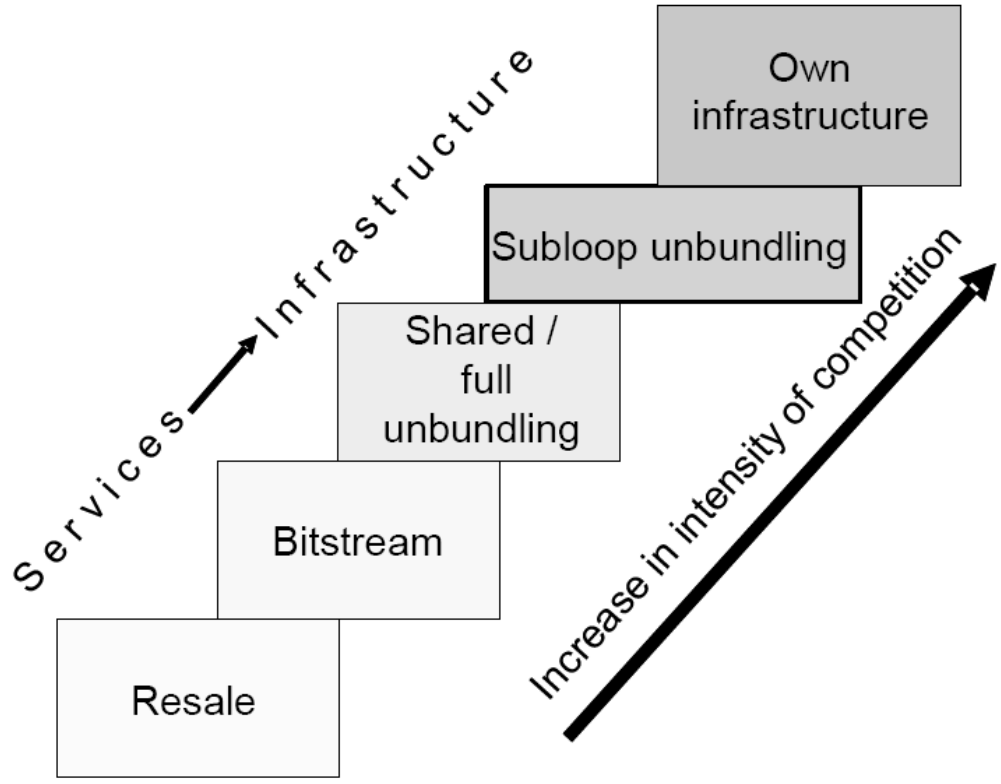
6.1 The ladder of investment hypothesis

According to this hypothesis, new entrants will start with the wholesale product that requires least investment (resale) and move up the ladder with increasing investment and service differentiation until they undertake full local loop unbundling and investment in alternative access networks. Figure 4 illustrates the steps in this process. The facilities-based competition that eventually results is more likely to lead to sustainable competition, spur dynamic innovation and encourage the diffusion of new technologies over time; ultimately enabling the relaxation or removal of access regulation. This scenario suggests that access seekers be permitted access to an incumbent's fixed-line network at different network access points (*i.e.*, the rungs on the ladder). The first rung is entry via reselling of an incumbent's services, the second is the provision of some form of replicable or independent add-on capacity to the incumbent's network and, on the third rung, an operator is expected to invest in network facilities of its own. In this way new technology is introduced into the market and contestability/competition achieved.[44]

A regulator may accelerate this process by foreshadowing that it will withdraw *ex ante* regulation at progressive stages of the ladder, when it considers that no bottleneck elements remain at the relevant rung, thereby encouraging entrants to climb up the ladder towards independent provision. This requires the regulator to identify when the bottlenecks that justified *ex ante* regulation no longer exist. As noted earlier (in Section 4), this might happen on a geographically disaggregated basis and as such, under a geographically segmented regulatory regime, the regulator should assess conditions in geographic markets in terms of a range of indicators, including: the number of firms, their competitive options and capacity to provide substitute wholesale services, changes in market shares, capacity in the market, developments in technology and its deployment and the long-term interests of end-users.

44. See *e.g.*, Cave, M (2006), "Encouraging infrastructure via the ladder of investment" *Telecommunications Policy.* vol.30, pp. 223-37.

Figure 4. Ladder of Investment



Source: ERG (2007), ERG Consultation Document on Regulatory Principles of NGA (ERG (07).

There are concerns, however, that in deciding to withdraw regulatory protection at a lower rung of the ladder, the regulator in effect risks leaving entrants vulnerable to the willingness of the incumbent to co-operate in providing access to the relevant service. Thus there must be confidence that, in trying to encourage a firm to begin its technological ascent, the firm faces an equivalence of opportunity to compete on the next rung of the ladder with the incumbent operator (and any other recent entrants who have progressed to this rung).

There are risks of "false positive decision errors" (when regulation should have been withdrawn at the lower rung, but was left in place) and "false negative decision errors" (when regulated access was withdrawn prematurely resulting in damage to the newer firms). One question in regard to these costs is whether it is easier to revisit a decision at a later stage and subsequently withdraw regulation, or to try to re-regulate the market after withdrawal of some or all regulatory constraints. In any case, in withdrawing regulation at a certain rung of the ladder and in certain geographic market segments, a regulatory authority needs to be confident that those operators previously protected by the regulation will have an equality of opportunity to compete in the market (and, accordingly, do not choose to exit when it would be more efficient for them to remain active in the market), either by: *a*) retaining their old supply sources and conditions of supply; *b*) by entering into contracts with alternative suppliers; *c*) by investing in their own facilities;[45] or *d*) by using excess capacity of other providers operating on the next rung of the ladder. In order to ensure that the 'ladder' can work, regulatory authorities may need to:

45. Or, indeed, whether these operators might not take the opportunity to compete and choose to exit the market instead.

- Ensure that all wholesale broadband access products are available over a reasonable timescale
- Announce a plan showing when the "rungs" of the ladder will be available so that investors can plan ahead
- Regulate wholesale prices so that operators receive increasing profit margins as they undertake increasing investments in wholesale products
- Require incumbent operators to provide easy migration for customers between wholesale products, for example so that migration can be carried out on a large scale, it can be completed quickly, and that migration can be carried out with a minimal loss of service
- In due course, reduce regulation on the lower rungs in order to encourage operators to move up the ladder (ERG 2007).

A number of incumbents (*e.g.* Telstra 2007) have argued that the ladder of investment model is a 'failed policy' claiming that it has in fact dampened investment incentives and delayed the development of sustainable facilities-based competition. They argue that there are a variety of technically and commercially viable substitutes for LCS and WLR, including LLU and, to a lesser extent, other competing access infrastructures, such that there is no bottleneck. And, because there is no bottleneck, downstream competition will not be compromised by the withdrawal of *ex ante* regulation. Thus, not only would competition be undiminished but efficient competition and efficient infrastructure investment and use would be promoted by the removal of regulation.

Some analysts have concurred with the incumbents' view that access regulation deters investment. However, Fontenay and Savin (2008) found that international benchmarks do not support claims linking mandated unbundling and wholesale access to lessened investment:

> "There is no empirical evidence that the European approach of regulating access has diminished investment, and anecdotal evidence that it has speeded the process."[46]

Friederiszick, Grajek and Roeller (2008) who investigate the relationship between access regulation and investment on the basis of data covering 180 European telecommunications firms over a ten year period, conclude that a stringent mandated access regime appears to have had insignificant effect on incumbents' investment although the investments made by entrants appear to have been reduced significantly.

How have regulators considered this debate in the context of geographically segmented regulation? The ACCC's stance seems typical of regulators that subscribe to rationale of the ladder of investment hypothesis. The ACCC (2008d) is satisfied that removal of WLR/LCS and PSTN OA access regulation will, on the whole, encourage access seekers to invest in LLU-based DSLAM/MSAN infrastructure, and that, if they did so, this would lead to facilities-based competition and be an efficient outcome. While there may be some efficiency losses in the short term (in the event of access seekers having to commercially negotiate for access service or, at the extreme, exiting the market altogether), these would be outweighed by the long-term benefits flowing to consumers from the increased take-up of 'higher rung' services such as the LLU, and the flow-on benefits of competition to consumers.[47]

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46. Fontenay and Savin (2008), Market power's challenge to internet policy: Mainstream academic analysis established that market power transforms the operation of the internet to reduce its innovation potential, a conclusion supported by empirical market evidence, November. p.30.

47. As the ACCC (2008c, 2008d) argues:
"Efficient, facilities based competition is more likely to be 'effective competition' (and therefore promote

6.2 Geographically segmented regulation and universal service

Critics of geographically segmented regulation argue that it could accentuate the digital divide by discouraging incumbent operators from investing in the delivery of innovative broadband services in regulated non-metropolitan areas (Fastweb, 2008). Incumbent operators could well focus their network rollout and service delivery efforts in the unregulated urban areas where the threat of mandated access to their networks at regulated rates has been removed. This could in turn force competing operators to also concentrate service delivery and investment efforts in urban areas in order to counter the incumbent's efforts, thereby diverting investment from, and thus further disadvantaging, non-metropolitan and remote regions.

As discussed in Section 5, removing regulation based on geographically segmented wholesale markets or geographically differentiating remedies may lead to geographic de-averaging of prices. This would tend to result in comparatively higher access prices being charged in non-competitive areas, such as small towns and sparsely populated rural areas. In short, it is likely that geographically segmented regulation will result in higher rural access prices. This could result in more investment in rural areas by the incumbent. However, since there is no compulsion for the incumbent to invest, the higher prices in an unregulated environment could equally be used by the incumbent to exert wholesale/retail margin squeeze and/or to support higher profits in these areas. While de-averaging of prices may have political repercussions, it may also give better incentives for investment. Alternative tools such as subsidies may be used to achieve social and political goals.

Retail prices could potentially also increase in rural areas since, if this does not occur, there is a risk of margin squeeze where wholesale access prices are raised while retail prices remain averaged. Thus, not only could rural areas be subject to geographically differentiated (higher) prices for access services such as WBA, but the pricing link with products offered in more competitive unbundled urban areas could be also removed. As a result rural prices and services could become increasingly distinct from those offered in areas where LLU is stimulating more competition in downstream services. A possible outcome of infrastructure-based competition, which tends to vary by geographic location, is therefore comparatively higher retail tariffs in those geographic areas where infrastructure investment does not take place. This potential outcome has implications for uniform pricing which has been an important feature of universal service policy (since implicit in universal service goals in many countries is national tariff averaging aimed at assisting rural households on the assumption that service costs are higher in those areas). Thus, if it is considered that price averaging is important in the promotion of affordability across the nation, the potential for geographically segmented regulation to threaten uniform pricing should be recognised.

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the LTIE) because rivals are able to differentiate their services and compete more vigorously across greater elements of the network (and supply) chain. It is also more likely to produce enduring benefits because competitors that have invested in their own infrastructure are more likely to remain in the market (because of high sunk costs)."

SECTION 7. A FORWARD LOOKING PERSPECTIVE OF GEOGRAPHICALLY SEGMENTED REGULATION

7.1 Implications of geographically segmented markets in an NGN environment

A forward looking perspective of the potential effects of geographically segmented regulation requires consideration of the competitive implications of next generation core and next generation access architectures. For instance, Telecom Italia (2008) has claimed that NGA will make the geographic approach to markets even more relevant (Telecom Italia, 2008). But others (*e.g.* ECTA 2008) argue that the as yet uncertain implications of NGA urge caution in the use of geographically segmented regulation.

Next generation networks involve two essential elements:

- The next generation Core refers to the core IP network and is characterised by replacement of legacy transmission and switching equipment with IP technology in the core, or backbone network. NGN network architecture allows for simpler, less costly and straightforward networks that are used to deliver all services.
- Next generation access (NGA) can refer to a broad range of access services, including cable, mobile, and fixed wireless. Most commonly it refers to bringing fibre closer to the customer in the local loop either to the street cabinet (VDSL) or to customer premises (*e.g*. GPON or Point-to-Point fibre). It is typically characterised by higher bandwidth and greater symmetry.

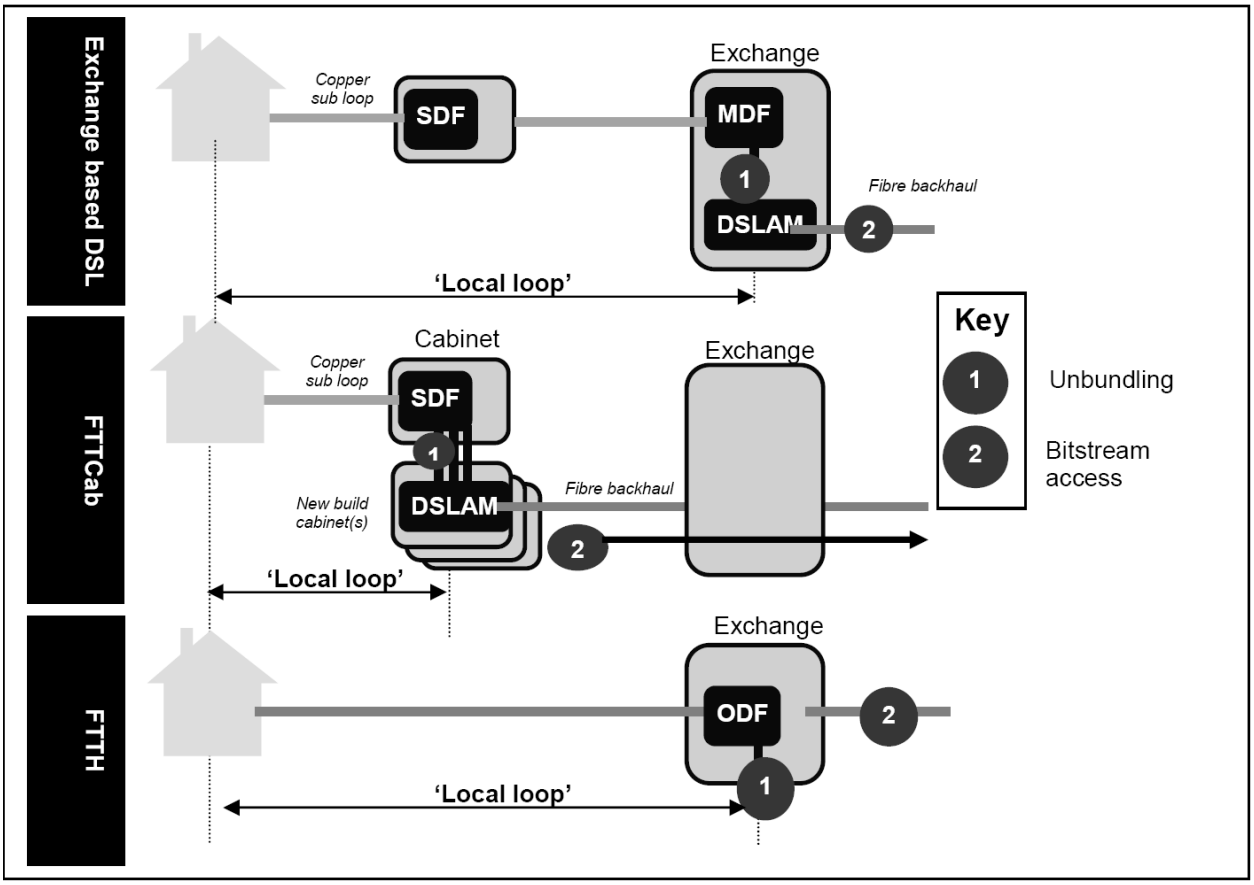
Figure 5 shows, under different technology scenarios, the local loop extension and the possible handover points for the operators' access to unbundling services or bitstream services. The scenarios can be used to analyse the regulatory challenges resulting from changes in the access infrastructure, particularly with regard to market definition, market analysis and, in case of an SMP finding, the imposition of specific regulatory obligations ('remedies') to overcome the competitive problems identified. Among other effects, the architecture of the local loop may impact on access to the local loop and/or the shortened local loop, sub-loop unbundling and bitstream access.

Of particular importance to this paper is the argument that next generation access infrastructure will 'strand' existing DSLAM investments and threaten infrastructure competition based on LLU and line sharing. In the case of FTTN deployment, a single feed architecture is likely to be deployed such that any access services (similar to the existing LLU service) would only be available at a point closer to the customer (such as at the pillar/node). Therefore, existing DSLAM deployment will become redundant since it is unlikely that any operator will wish to retain a dual customer access architecture with some customers connected to the NGA while others continue to receive exchange-based access via LLU or line sharing.[48]

48. As Telstra stated in a submission to an Australian Government inquiry:
"For … technical and economic reasons … [next generation broadband] requires an "all or nothing" solution in which all customers – *including* those living near the exchange – are migrated to the [next generation broadband network]. As a result, the [next generation broadband network] and unbundled

A number of incumbent operators have already announced their intention to abolish local exchanges as part of the migration to all-IP access and core networks. For example, in the Netherlands, KPN announced in 2006 that it would progressively roll out an all-IP NGN and would commence de-commissioning local exchanges and selling the underlying real-estate in order to partly fund the new network rollout (Opta, 2008).

Figure 5. Examples of the 'local loop' under different technology deployments



Source: ERG (2007), *ERG Opinion on Regulatory Principles of NGA*. July, p. 7/66.

Additionally, there are technical, operational and economic constraints to competitors gaining access at the sub-loop level. These constraints are sufficiently severe such that although competitor access to the sub-loop has been mandated by European regulators for a number of years, take-up of the sub-loop access service has been insignificant. In regard to the economic hurdles associated with sub-loop access, a report prepared for the Netherlands regulator, OPTA, concluded that the use of a sub-loop access service by a competitor to the incumbent FTTN provider would only be commercially viable in the densest urban areas or where consumers are 'high volume'. Even in these cases, investment in sub-loop access would be justified only on the basis of significant reductions in the incumbent's proposed charges for the sub-loop

copper access services such as the line sharing service (LSS) and ULLS, whether full loop or sub-loop, cannot feasibly co-exist in an exchange area with the [next generation broadband network]."

access service, co-location and backhaul (Analysys, 2007). As Fabian and Von Hirschhausen (2008) point out:

> "In NGNs, physical unbundling becomes increasingly difficult with the rollout of fiber-to-the-home (FTTH) deployments as current points of interconnection such as the main distribution frames (MDF) or the street cabinets become obsolete and are phased out. In the case of FTTH, investments by competitors to interconnect physical access points in the local loop could ultimately be stranded."(Fabian K and Von Hirschhausen C, 2008)

The foregoing suggests that even in sub-markets which are currently considered effectively competitive because of the presence of competing LLU infrastructure-based operators, there is reason to be wary of removing *ex ante* obligations on the incumbent at the least until the regulatory framework regarding NGA is more fully developed. A number of regulators have recognised the potential for re-monopolisation of currently competitive markets under an NGA environment and are moving to put in place measures aimed at safeguarding existing competition. The Irish regulator, ComReg, for example, has announced its intention of retaining existing obligations requiring Eircom to provide the current range of regulated wholesale products for the foreseeable future and to impose further obligations on the incumbent in regard to the notification period required prior to any possible removal of exchanges and of copper loops used by competitors (ComReg 2007). Similarly, in Portugal the regulator has identified a range of *ex ante* obligations that are likely to apply in both currently competitive and non-competitive areas in the transition to an NGA environment. These include access obligations in respect to LLU, DSL Bitstream and duct sharing, as well as regulated access to a fibre bitstream access product (see Table 2).

Table 2. Possible *Ex ante* regulation in Portugal in an NGN environment

	Possible future approach to remedies	
	Competitive area	***Non-competitive area***
Local loop unbundling	Keep regulation; info needed of evolution of network	
Subloop unbundling	Keep regulation (but not a priority)	
xDSL Bitstream access at regional and national level	Possible fine-tuning of access obligation	Keep regulated access
Ducts and other passive infrastructure	Generic access obligations rather than detailed reference offer	
Fibre loop unbundling	Not considered; it would disincentive deployments	
FTTH Bitstream access	Regulated access with possible *"sunset clause"*	Regulated (for services not available on copper)

Source: Rodríguez, Regulation in a NGAN Environment, June.

Regulatory authorities should consider establishing a clear ladder of investment for an NGA environment that clearly includes fibre LLU and sub-loop unbundling alongside duct access and wholesale bitstream access.

In the Netherlands, Opta has already mandated the requirement for unbundled access to the sub-loop in the case of FTTC and unbundled access to fibre optic connections in the case of FTTH.(Opta, 2008). This decision was in response to KPN's announcement that it would be decommissioning local exchanges, effectively stranding competitors' DSLAM investments. In France, ARCEP has determined that in dense

areas, more than one network is likely to be deployed to buildings, and as a consequence, a service provider deploying a vertical portion of in-building cabling will have to inform its competitors, and the competitors will have the opportunity to share the deployment cost and lay their own parallel fibre. Outside of dense areas, there is no such obligation.49

The deployment of NGAs may not only necessitate the continuation of *ex ante* regulation in respect to existing access services, such as LLU, but may require the introduction of new access obligations in those geographic markets where next generation access networks have been rolled out. With the introduction of NGA, new bottleneck points will emerge leading to new sources of market power for incumbent operators. One key source of market power will be ownership of the passive infrastructure required to install fibre-based NGAs. As the FTTH Council Europe (2008) noted:

> "In the case of NGAs, that first bottleneck is not necessarily the network, but instead the primary bottleneck is the passive infrastructure within which the network sits… A prerequisite to having entrant operators in a position to take the initiative for large scale fibre deployments is access to the passive infrastructure which constitutes such a large proportion of costs and where access facilitates a speed of deployment not possible without such access."(FTTH Council Europe, 2008).

Various studies that have examined the economics of NGA have concluded that civil engineering costs are key barriers to competitors replicating an incumbent's FTTN or FTTH NGA deployment.[50] Such costs can represent more than 70% of deployment costs for next generation access infrastructure (Ofcom, 2006). The bottleneck nature of passive infrastructure has been recognised by the EC which has recommended that in an NGA environment, SMP dominant operators should be required to provide regulated access to new and existing ducts, civil engineering works and other elements that are not active and that are necessary for the roll-out of competing infrastructure (European Commission, 2008). In a number of countries, such as France, Germany, Portugal and Spain, regulators have legislated to allow access to the incumbent operator's physical access infrastructure.

It is also highly likely that collocation of competitor equipment in a dominant operator's exchange buildings or street cabinets will become an increasingly significant interconnection control point in an NGA environment. These emerging issues are likely to require an effective regulatory framework to encourage and promote competition in an NGA environment. Removal of *ex ante* access obligations whether on a national or geographically determined basis is, therefore, likely to be premature. If NGA developments reduce the prospect of competition through the upstream remedy of local loop unbundling there may be need to re-review segmentation of the WBA market and possibly reintroduce it on a nationwide basis. For example, in the Netherlands, there have been proposals that consumer-grade WBA be introduced to address vDSL access issues – whereas it was not considered necessary in an LLU environment.

A further issue relating to geographic segmentation is the prospect that regional NGA dominant operators may emerge where economies of scale and scope prevent duplication, and the first mover thereby secures a dominant position. This does not mean that competitive levels are different, but rather that there could be differences in the SMP operator in different areas, such as already exists in Finland, Hungary or in Hull in the United Kingdom.

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49. Interestingly, this led one commentator to point out that ARCEP's differentiated regulatory treatment of dense and non-dense areas seemed to apply geographically segmented regulation. See http://www.fibrerevolution.com/2009/06/arcep-clarifies-vertical-sharing-mechanism.html

50. See for example, WIK (2008), *The Economics of Next Generation Access* - Final Report, September.

Where there is a prospect that the investment of new entrants will be stranded, it is important that the process, time frame and details of MDF closure is transparent and made known to new entrants well in advance of any action by incumbents. Regulatory authorities have an important role to play in this context.

Where adequate facilities-based alternatives are unlikely to develop, the network architecture chosen by incumbent telecommunications operators for their next generation access network will have important implications for access and competition in the communications market. Most of the fibre access solutions are based on a network topology where it is much harder, technically and/or economically, to unbundle loops. Wholesale broadband access, such as bitstream access in xDSL markets, can provide some service competition, but is insufficient in the long run in providing sustainable effective competition. The development of fibre networks requires regulators that have mandated local loop unbundling to assess the economic and technical feasibility of continuing LLU policies, taking into account investment plans of the incumbent, the presence of alternative network infrastructures, and the characteristics of particular markets, amongst other things. In addition, ensuring sub-loop unbundling, where this is feasible, access to rights of way and ducts for new entrants, regulations for backhaul from street cabinets, and regulations for sharing inside wiring of buildings are measures that can reduce barriers to competition, both to promote facilities-based competition and to enable certain unbundling polices as fibre is deployed further into the access network. In those countries that have not mandated LLU, policy makers may need to examine ways to stimulate inter-modal competition.

In an NGA environment, access regulation concerns not only how to ensure provision of access to *existing* network elements or services but also how to ensure that new network elements are installed in ways that permit efficient access opportunities to occur. For instance, the possibility that competitive operators can collocate is increased, and the cost of collocation decreased, if new street cabinets are designed and constructed for collocation capabilities (WIK 2008). Thus, regulators should ensure that architectures designed by dominant operators respect regulatory obligations in the most transparent and efficient manner possible. The preceding discussion makes it clear that regulatory decisions should consider expected developments. Under the EC regulatory framework, market reviews are required to include an evidence-based forward-looking assessment. This needs to consider the period which the market review is intended to cover – generally four years. If, under the forward-looking assessment, there is clear evidence that suggests that the market is likely to change significantly in the period covered by the review, then this should be appropriately taken into account. For example, if the changes are highly predictable then they can be factored into the assessment. Alternatively, if they are not predictable but also not expected to happen in (say) the next two years, then the period covered by the review can be shortened, which will lead to an earlier re-review. Finally, if they are not predictable but there is evidence that suggests that they are likely to happen imminently, there may be a case for deferring the review for a short period.

7.2 Investment in an NGN environment

The issue of incentives for investment in access networks is a critical one, especially since with the onset of NGA substantial further investment will be required. Thus policy and regulation must be mindful of the need to help ensure that such investment is forthcoming and certainly that it is not impeded. How could geographically segmented regulation affect investment in an NGA environment?

Some access seekers have claimed that they have decided to defer efficient investment in equipment such as DSLAMs or MSANs due to fears that their LLU investments will be ‘stranded’ following a FTTN upgrade (the investment could become stranded because the fibre would be deployed to the cabinet, bypassing the exchange)(ACCC, 2008). In short, if, as seems likely, the prospect of geographically segmented regulation increases the uncertainty about whether, and for how long regulatory mandated bitstream, access to ducts etc., will be maintained, this will further increase the uncertainty that undermines

investor confidence to make efficient, adequate investment in an NGA environment. This uncertainty would be compounded if geographic regulation is characterised by disputation and appeals that have been observed as a result of its use in Australia. This is an important consideration since the regulatory regime is a major influence that can directly or indirectly influence investment levels, technology choice, reach, timing of rollout, commercial strategies, products and prices.

On the other hand, incumbents have argued that it is necessary to shift to geographic regulation in order to take into account the fact that certain markets have become competitive. At the same time incumbents have also argued that they need to be freed from regulatory obligations in general to provide them with an incentive to invest in fibre networks. However, clearly as new network topologies are put into place, competitive conditions in the market are likely to change so to a large extent the two different arguments put forward by many incumbents may be contradictory. If competition is building up in broadband markets through the upgrading of CATV networks and through investment by new entrants in fibre infrastructure in the same geographic market, then the two arguments may be consistent. In many cases, however, this is unlikely to be the case so that regulators may need to assess how investment in new technologies impacts on competitive conditions, as well as assess what steps they can take to facilitate competition in markets relying on new technologies, before moving towards a geographic segmentation of the market.

7.3 Geographically differentiated regulation and regulatory remedies in an NGA environment

Cave (2008) suggests an approach to regulation in an NGA environment that is relevant to the focus of this paper. He suggests that in thinking about appropriate regulation in an NGA environment it is useful to distinguish three different geographic areas:

1. Potentially competitive.
2. Probably monopolistic, but where NGA investment can be commercially justified.
3. Non-commercial.

Different regulatory approaches would then be applied to these geographic areas, namely:

1. Forbearance from access regulation
2. Mandatory access to a dominant NGA
3. Mandatory access to one or more collectively dominant NGAs in a geographical market.

Cave's proposed approach is broadly consistent with the ERG's (2008a) position in regard to differentiated remedies applied within a single national market. As in the case of current generation access networks, the applicability of the approach depends on analysis of the degree of market differentiation and expected competition and the remedies considered appropriate in each market. And it would depend on whether the cost of applying the scheme (including all the problems of uncertainty, unpredictability etc., discussed earlier) are considered to be worth bearing when viewed against the benefits expected to accrue. For instance, Neumann (2009) argues: "NGA development *per se* does not require [us] to address the issue of sub-national markets. NGA will only have an impact on the need to define sub-national markets for certain markets and/or to differentiate remedies on a geographic basis if the degree of replicability of access services will be increasing due to NGA investment." This suggests that in an NGA environment, the need to apply geographic regulation will become clearer as the effects of NGA on competition become clearer. A shift to geographic regulation at this stage may be premature and risky.

1. Geographically deregulated regions

In geographically deregulated regions, this would mean in effect withdrawing *ex ante* regulation and allowing the market to determine the development of fibre networks. One scenario that could develop from this is that the incumbent attains a dominant position and exerts market power in the next generation access market which would be extremely difficult, *ex post*, to correct through regulatory measures. This is because the configurations of many fibre networks do not allow for unbundling or allow for unbundling but only at a high cost. In most cases only wholesale broadband access will be feasible and it is not evident that such service competition will be sufficient to create effectively competitive markets.

2. Geographically regulated regions (remaining under *ex ante* regulation)

In the context of fibre networks, work conducted by the OECD (OECD, 2008d) suggests that in areas that are not geographically deregulated, policy makers and regulators need to maintain *ex ante* regulation, including:

- Ensuring access to rights of way at reasonable prices, and preferably at no charge, for new entrants and incumbents.
- Ensuring access by new entrants to existing ducts/poles of both network operators and utility companies and municipalities.
- Regulations to ensure the sharing of access to the inside wiring of apartment buildings and homes.
- Facilitating access to street cabinets and collocation in street cabinets. Regulators need to work with municipalities to find solutions to avoid excessive duplication of street cabinets[51] and/or restrictions on investing in street cabinets by new entrants.
- Municipal networks considering playing an important role in enhancing competition in fibre networks should encourage them to be open networks. That is, providing dark fibre to service providers rather than becoming themselves service providers. Nor should the existence of a municipal network providing dark fibre mean that investment in other fibre networks in that municipality should be prevented.
- Where mandated, ensuring wholesale broadband access is provided on a non-discriminatory basis including quality of service.
- Where adequate facilities-based alternatives do not exist, consider applying local loop unbundling policies to new fibre networks, in particular sub-loop unbundling since with certain fibre configurations (FTTN) new entrants will need access to street cabinets[52].

3. Non-commercial areas.

51. Several authorities in OECD countries are addressing this issue. In the United States, the Telecommunications Act of 1996, as well as various FCC orders that implement the statute, set forth numerous requirements that US local carriers must meet in order to provide competitive carriers with reasonable and non-discriminatory access to ducts and rights-of-way. In France, the ARCEP published at the end of 2007 the results of a consultation on duct sharing, and initiated at the beginning of 2008 technical work with the operators on infrastructure sharing and on the localisation of the adequate points of mutualisation. In Japan, a guideline for use of poles, ducts, conduits and similar facilities owned by public utilities was amended in 2007 to add provisions regarding procedures to facilitate the installation of lines in the last mile (OECD 2008d).

52. Sub-loop unbundling at the cabinet is only applicable for FTTC technologies. A difficulty faced by sub-loop unbundlers is that they will need to recover costs from the smaller number of potential customers served by a cabinet, by comparison with the potential customers at a local exchange, where local loops are unbundled.

In the case of non-commercial areas, the regulatory task is primarily to try to create the best conditions for investment, including through spectrum availability and management strategies (including spectrum allocation, liberalisation and trading). It is important that the regulatory regime does not prevent or distort use of any technologies or platforms in the delivery of new services to end users for broadband but also for other services. A multi-platform environment, allowing services to be made available from a range of networks, is critical to sustaining investment and innovation and thereby maximizing choice and benefits to residential and business consumers.

Compared with the situation for consumers in densely populated urban areas, who are likely to experience further speed increases as a result of next generation networks deployment, rural consumers may see little improvement in their current, limited internet connectivity. An expanding gap between those with and without access to next generation broadband services will raise universal service/ 'digital divide' concerns. This is a very significant issue, but also a very complex one outside the scope of this paper (OECD, 2006).

SECTION 8. CONCLUSION

The potential implications of moving towards sub-national geographically disaggregated regulation turn out to be far-reaching. In addition to disputes over the right principles to be applied, there are the problems in applying them and the concerns over uncertain potential outcomes. In combination, these lead to concerns that could prove counter-productive in terms of efficiency, competition, investment and broader effects.

8.1 Potential benefits of geographically segmented regulation

The potential benefits of geographically segmented regulation were explored in the foregoing sections of this paper. It would enable regulation to better recognise the unevenness that has developed in competitive circumstances between various geographic regions. Accordingly, *ex ante* regulation could be withdrawn in effectively competitive areas, and regulation maintained/strengthened in areas where competition is ineffective. In principle, removing unnecessary constraints on incumbents that provide unnecessary protection to access seekers will reduce distortions to efficient competitive decisions; and allow prices to more closely reflect competitive circumstances, costs and investment requirements.

But the conclusion reached is that there remains considerable uncertainty and risks about the extent to which withdrawing *ex ante* regulation facilitated by geographically segmented regulation would materialise claims (*e.g.* by incumbents) that it would:

- Promote competition
- Promote more efficient use of infrastructure; and
- Promote more efficient investment in infrastructure.

Moreover, the uncertainty and risks increase as a forward looking perspective that includes expected developments in NGA is adopted. But not deregulating geographic markets where there is no longer significant market power could, according to some views, reduce predictability and the stability of the regulatory regime.

Benefits in terms of the long-term interests of end-users?

The impact on consumers is a critical consideration. Indeed an often-repeated statement by politicians and regulators is that policy and regulation are designed to be in the long-term interests of consumers. In fact, in some countries (*e.g.*, Australia), the over-riding criterion is explicitly that decisions must be in the Long-term Interests of End-Users (LTIE). But assessment of the LTIE is not easy, especially when a forward looking perspective is taken. Indeed, in regard to Telstra's exemption applications, this led ATUG (2008) to suggest that more work is needed to define the markets from the perspective of end-users.

The usual indicators used to monitor effects on consumers include lower prices, improved quality of service, enhanced technology and greater choice (including effective choice empowered by ease of switching from one operator to another). Would end-users in markets deemed competitive or non-competitive benefit from geographic separation of markets? The benefits to consumers in areas deemed competitive would materialise if competition and investment are, indeed, enhanced as a consequence of a withdrawal of *ex ante* regulation. But, as discussed earlier, there are considerable uncertainties about the

extent to which this would occur. In non-competitive areas, some consumers may well face comparatively higher prices as a result of new pricing freedoms (unless price regulation is applied to constrain such price increases).

8.2 The costs of geographically segmented regulation

As noted above, failure to take appropriate account of geographical realties can result in inefficient and potentially harmful regulation. Geographically segmented regulation may enable the benefits of deregulation to be realised in certain locations, even if the competitive situation would not warrant such deregulation nationally. Regulators could also use geographic segmentation to impose additional regulations in a targeted manner in the specific locations where regulation proves necessary. In either case, this tool can assist regulators to ensure that the regulatory framework they apply is appropriately tailored to the competitive situation.

Geographically segmented regulation faces a number of potential problems, however - and could generate a range of costs - including:

- Uncertain criteria and lack of clear principles to guide application of sub-national segmentation
- Complexity and degree of subjectivity/discretion with uncertain outcomes that results in reduced predictability and stability of the regulatory regime
- Uncertain effect on competition and investment
- Uncertainty of outcomes, including impact on end-users, especially as migration to an NGA environment occurs
- Risk of premature deregulation that could result in a reduction of competitive conditions
- More complex, more difficult to understand regulation with some loss of transparency
- Additional burdens for the regulator *e.g.*, more regulatory analysis, more difficulty in regard to monitoring and enforcement
- Additional burdens for operators with higher transactions costs for the incumbent but also for competitors; and
- Threat to uniform pricing (which is a dimension of universal service) since de-averaged prices may be necessary to avoid margin squeeze.

The overall question regulators need to address is whether the benefits of a reduction in regulation in certain areas facilitated through geographically segmented/differentiated regulation outweigh the costs associated with the additional complexity of administering the resulting regulatory regime.

i) Uncertain criteria to guide sub-national segmentation

As discussed in Sections 2 and 3 of this paper, the principles and criteria for the definition of sub-national markets are unclear with a range of difficulties and uncertainties and subjectivity in regard to the geographic dimension of market definition which remain, although the ERG (2008a) has done much to address such deficiencies. Moreover, the geographic area covered by each local exchange may change over time due to changes in network architecture of the incumbent which may consequently change the market boundaries and competitive conditions.

In principle, a separate market review is required for every individual geographic market. This would place an unrealistically heavy burden on the regulator, and an equally heavy burden on industry, *e.g.* to produce the necessary data required to support the market investigation. So it would be necessary to aggregate markets. But the criteria for aggregation is not clear since it could (incorrectly) be based on political or administrative boundaries, the incumbent's network structure such as local network and main

distribution frame, or on the existence of further network infrastructures. As the ACCC (2008a) concluded from its experience in applying geographically segmented regulation in Australia, determining the precise scope of the areas to be covered by the exemptions is a "finely balanced process involving a level of judgment."

Competitive conditions may vary within a national geographic market, but not to the extent that warrants a definition of sub-national markets. Some argue that in this case it may be appropriate to locally differentiate the remedies that will be imposed on the operator designated as possessing dominance in the national market. However there are concerns that the definition of a threshold between sub-national geographically segmented regulation and conditions warranting the differentiation of remedies within a single national market is not clear and that this lack of clarity could give rise to arbitrary decisions by national regulators.

Clear guidelines that precisely specify the conditions under which each of the two different approaches should be used are needed. This will help dispel fears that regulatory authorities might use differentiated remedies to deregulate a market as a substitute for market segmentation (since this may be more difficult to justify).

If such difficulties were the only problem it might nonetheless be preferable to embrace the "imperfect" correct approach (*i.e.* geographic segmentation of markets) rather than continue with a less problematical but incorrect geographically uniform treatment. However, there are, as well, a number of other significant concerns and risks relating to geographically segmented regulation that can erode the stability, certainty and predictability so important in a regulatory regime. Indeed this uncertainty is manifest in the EC approving only some of the proposals for geographically segmented/differentiated remedies. As noted earlier, the EC approved proposals by Ofcom in the United Kingdom, TKK in Austria and Anacom in Portugal but not proposals from Ficora in Finland and CMT in Spain.

The implementation of the scheme, too, promises to be a complex task leading to more uncertainty and less stability and predictability in the regulatory regime. Moreover, as exampled in Australia, the difficulty in providing robust evidence is formidable as evidenced by the ACCC's decision (in August 2008) to exempt Telstra from *ex ante* regulation being "set aside" by the Australian Competition Tribunal (December 2008) - which was unconvinced by the criteria applied and the 'evidence' submitted by the ACCC - and the Tribunal's own decision being set aside by the Australian Federal Court (in March 2009) on the grounds that the Tribunal had not applied the right criteria under the law. In August and September 2009, the Tribunal confirmed the ACCC's decision that there is a case for winding back regulated access to Telstra's wholesale voice services in certain metropolitan and CBD areas, when and where competition has sufficiently developed (ACCC, 2009).

ii) Uncertain impact on competition

Although a commonly used criterion, it is not enough to demonstrate that the number of competitors has increased or even that competition has increased. To ensure that the end-user has benefited, the requirement is for thorough comprehensive assessment of sustainably competitive conditions and persuasive evidence to be tabled that *outcomes* are in the consumer interest. The experience of countries that have applied geographic regulation suggests that guidelines regarding assessing the nature and extent of competitive conditions and the evidence required need to be clearer. After all, this is a key issue in decisions about whether it might be appropriate to withdraw or retain *ex ante* regulation.

Geographic segmentation of WBA could be risky for some OECD countries deploying NGA infrastructures. This is especially the case where upstream competition is largely dependent on LLU. This is because if segmentation is implemented, it would make sense to follow the boundaries of LLU

investments – *i.e.*, MDF sites. But with the prospect that these sites will be dismantled and copper decommissioned, such a boundary risks becoming obsolescent. In this context, it is notable that the EC (in its Article 7 letters to Ofcom and Austria's regulator in response to their proposals for regulatory differentiation), warned that NGA developments could undermine the competition through LLU that justified the segmentation of the WBA market. Since NGA developments in many OECD countries are in process or anticipated, it could be premature, risky and counter-productive to segment WBA (de)regulation at this point. Indeed, if de-regulation is premature, it may be difficult to re-regulate, especially where the regulator has lost the power to exercise *ex ante* regulation.

Segmentation of the market and/or differentiation of remedies needs to be carefully assessed by regulatory authorities and only applied where the risk that effective competition in the market can be reversed is low and where adverse effects in adjacent markets (markets in which an SMP firm can leverage market power) can be excluded (Fastweb 2008).

If the incumbent can raise wholesale prices but not retail prices in rural areas, margin squeeze could result. But if higher retail prices can be levied, the higher profit generated could be used for cross-subsidisation purposes. Since an incumbent operates across all geographic regions and at various levels of the telecommunications value chain, this provides scope to use profits from less competitive areas to subsidise losses in more competitive areas. But the task of establishing whether such regional cross-subsidies are taking place may be challenging since it is unlikely that an incumbent maintains sufficiently disaggregated accounts. To address this concern the regulator would have to require the production of such accounts, including the form that such accounts should take. It is difficult enough to install an accounting separation scheme that provides transparency over vertical relationships within an SMP incumbent. Installing a similar regime for horizontal relationships between different regional divisions is likely to be as difficult, if not even more so. Also, if geographic regulation requires disaggregation of an incumbent's accounts, this will be difficult to achieve and the regulator may need to provide guidelines on the allocation of shared costs between different geographic areas. Moreover, the well-known problems of allocating costs, including joint and common costs between services, are likely to be compounded if there is need for geographically separate accounts.

As ERG (2008a) emphasises, geographically segmented regulation should not aim only at facilitating deregulation but also at strengthening regulation in regions where competition is found to be ineffective. This suggests that regulators should consider how these markets can be subjected to more stringent regulatory requirements. (Ofcom's approach to this issue is indicated in Section 3 of this paper, summarised in Box 2).

iii) Uncertain effects on investment

A key objective of policy and regulation is that all operators have strong incentives to invest. While investment incentives are affected by a range of factors influencing expectations of profitability, the regulatory regime is a critically important factor. In this context, geographically segmented regulation could be problematical. For instance, some operators with upstream investments (*e.g.* in LLU) could face increased scope for margin squeeze and cross-subsidy and higher prices in areas where they rely on bitstream. In addition, withdrawal of *ex ante* access regulation in areas with effective competition may neglect the needs of operators that function through integrated service provision. In particular, business service providers' requirements might differ from those of other operators because of their customers' demand for geographically dispersed sites to be connected. This might make it prudent to consider that markets for the provision of business products are national in scope so that geographically segmented assessment of variation in competitive circumstances would not be appropriate in this case. However, if an exception is made for business service provision on these grounds, the scheme becomes further complicated.

Policy makers should promote service competition and infrastructure based competition at the same time. Provided the wholesale price is right, regulated access does not preclude and can provide a platform for further infrastructure deployment where this is efficient.

As noted earlier, bitstream (and other wholesale access services) is an important element in enabling operators to enter the market and build sufficient scale prior to making further investments *e.g.* in LLU. Removing this possibility would increase barriers to entry and expansion in the market and thus impact on competitive incentives for those present in the market. The regulatory framework must endeavour to strike the right bitstream price and balance between incentives to invest, including investment in NGA, and the avoidance of a re-monopolisation of the access network. In the present state of uncertainty about the effects of NGA on competition, this is difficult to do. One (cautious) approach is for regulatory authorities to allow time for the market to develop before deciding whether and how to segment the national market.

iv) Increased burden for both regulators and operators

There should be careful consideration of the increased burden that the more complex geographically disaggregated regulation will be for both regulators and operators. The necessary analysis preceding, and the implementation of, geographically segmented remedies can make regulation more complex, more difficult to understand and more difficult to manage. For instance, a regulatory authority would need to consider possible implications of deregulation in one geographic market on other, adjacent geographic markets; ensure that the prices of different wholesale products remain consistent; ensure that remedies can still be implemented effectively etc. As it is, one of the criticisms of the current regulatory regime noted in the United Kingdom Strategic Review (Ofcom 2005), in Australia (ACCC 2008a), and elsewhere, is that regulation consists of a mesh of individual obligations on the incumbent, often with conflicting objectives. It seems likely that geographic segmentation will make regulation more complex, indeed, with the potential to frustrate objectives to reduce and streamline regulation (Ntl 2006) – the very objectives geographically segmented regulation seeks to pursue.

There could also be higher transaction costs as a result of geographically segmented regulation. For example, it is highly likely that greater effort will be required to assemble a national offering -- particularly for operators that require bitstream coverage on a national basis, such as business service providers. There is also a risk that suitable equivalent products might not, or might no longer, be supplied in some areas deregulated under a geographically segmented regime. As well, while mass market providers rely less on bitstream in LLU-feasible areas, their coverage may not match precisely the deregulated region identified by the regulatory authority, and in some cases further LLU investment may be commercially unviable to service these areas. In such cases, there may be service gaps or additional transaction costs if a number of different providers are used to address these gaps (ECTA 2008).

There may also be problems in the implementation of geographically segmented regulation in regard to administrative procedures and execution. For instance, assessing costs regionally – even where such data is available - would probably increase administrative burdens. Also, regional differentiation at one level of the supply chain may require equivalent regional data collection in downstream markets – for example to guard against the threat of margin squeeze. The effort and cost of providing the new data is likely to be significant. Thus, regulatory authorities will need to consider an operator's cost and ability to report on a geographic basis so as to ensure that compliance with its regulatory obligations can be effectively monitored.[53]

53. As Ofcom (2008) recognises:"This new market definition implies that BT will need to prepare regulatory financial statements on a geographic basis for the first time. Ofcom has already indicated that the preparation of these statements along with the underlying cost attribution methodologies will require significant enhancement for the results to be robust on this new basis. For example, this approach will

v) Impact on universal service

Will geographically segmented regulation facilitate universal service? Telefonica (2008) argues that geographic segmentation allowing *ex ante* regulation to be withdrawn from some areas will enable greater policy and regulatory attention on concerns in less competitive areas, including universal service. However, as noted earlier, geographically segmented regulation could accentuate the digital divide by encouraging incumbent operators to focus their network rollout and service delivery efforts in the unregulated urban areas where mandated access to their networks at regulated rates has been removed. In order to counter the incumbent's efforts, competing operators too may increase investment and competitive efforts in urban areas thereby diverting investment from non-metropolitan and remote regions. Also, geographically segmented deregulation of wholesale markets may lead to higher access prices being charged in non-competitive sparsely populated rural areas. As a result, retail prices could also increase in rural areas (since, if this does not occur, there is a risk of margin squeeze). This prospect has implications for uniform pricing which has been an important feature of universal service policy in many countries. Thus, if it is considered that average uniform prices are important in the promotion of affordability across the nation, the potential for geographically segmented regulation to threaten uniform pricing should be recognised.

8.3 Are benefits clearly greater than costs?

The broad conclusion of this paper is that a cautious approach be adopted in deciding whether to implement geographically segmented regulation. While the rationale of sub-national geographically disaggregated regulation appears persuasive in principle, the broader implications of the policy must be recognised. The experience of the small number of countries that have already implemented the scheme suggests that this may be another case where "the devil is in the detail" since there are considerable difficulties in implementation and uncertainties in outcomes.

Some countries may be obliged to apply geographic regulation where clear evidence exists that sub-national markets can be defined (*e.g.* EU Member States). However, other OECD countries may have more flexibility in regard to the use of geographic regulation as regulators in these countries may be able to implement a policy-driven approach. For these countries, the overall question regulators need to address is whether the benefits of a reduction in regulation in certain areas facilitated through geographically segmented/differentiated regulation outweigh the costs associated with the additional complexity of administering the remaining regulatory regime. Countries considering its implementation will need to consider how such problems will be addressed and the costs minimised. Uncertainty over the implications of NGA should also be taken into account when considering the effects of geographically segmented regulation. Such investment may change market power, in particular market power could change depending on the network configuration used in rolling-out fibre to the home. This suggests that, where possible, it might be sensible for regulators to be cautious and to take into account NGA deployment before deciding whether to install geographically segmented regulation.

require BT to be able to locate and value specific assets on a geographic basis. Therefore the current design of the published financial statements and supporting data provided to Ofcom may not be sufficient for compliance monitoring purposes." See Ofcom (2008), "The regulatory financial reporting obligations on BT and Kingston Communications Final statement and notification" available at

www.ofcom.org.uk/consult/condocs/fin_reporting/fin_report_statement/finance_report.pdf

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