

The regulation of access in telecommunications: a European perspective

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Introduction

When should a telecommunications firm have to make its assets available to competitors under sector-specific regulation rather than generic competition law? This question has been debated since competition began decades ago, although the focus has now switched from the supply of voice to that of broadband services. Everyone has a lot at stake in its resolution: competitors, who may depend on access to stay in the market; incumbents, whose market power and investment incentives depend on the regulatory approach adopted; regulators, for whom control of access and interconnection is now their main business; and above all end users, whose access to and use of current and new services depend upon those regulatory decisions.

The installation of fibre closer to the home and growing prominence of convergent IP-based networks with different architectures from the traditional PSTN are adding a new twist to the debate throughout the world. How these will be regulated is thus a matter of key importance, the salience of which increases as the new technology gets closer to the end user, and the conflict between promoting innovative investment and opening up a bottleneck becomes more and more acute.

* The sections of this paper dealing with IP networks in particular rely on joint work with Matthew Corkery of Ernst & Young and Warwick Business School. This paper was delivered as a public lecture in London on October 26, 2006.

This paper describes how the issues are being approached under the European regulatory framework, which makes a concerted effort to adopt a consistent ‘market power’ framework. Section 1 describes that framework, and how it relates to competition law. Section 2 reviews the practice of regulating current generation broadband. Section 3 discusses evidence relating to its consequences. Section 4 presents some conclusions and their implications for the IP World. The focus is on ‘standard’ broadband services of the kind normally supplied to households. Higher speed, higher quality broadband sought by business customers, especially SMEs, requires a separate analysis in which the lack of competitive pressure from cable companies – where they exist – is highly relevant.

Section 1. THE EUROPEAN REGULATORY FRAMEWORK AND COMPETITION ANALYSIS

A. The framework

The new European framework for regulation of electronic communication services (ECS) came into force in 2003 and is already subject to a debate over how it should be reformed from 2010. The main objectives of the current framework were to simplify the previous regimes, to apply them in a technologically neutral manner, and to encourage competition while guaranteeing user rights. At one level, the new régime was perceived as a major step down the transition path between regulated monopoly and normal competition, governed exclusively by generic competition law. The conditions that may be imposed are heavily circumscribed, and many require a demonstration that an operator has significant market power. The new regime's provisions are applied across the range of ‘electronic communications services’, ignoring pre-convergence distinctions. It thus represents an ingenious attempt to corral the NRAs down the path of normalisation - allowing them, however, to proceed at their own speed (but within the uniform framework necessary for the internal market).

Under the Directives, the European Commission first establishes a list of markets where *ex ante* regulation is permissible, the markets being defined according to normal

competition law principles. These markets are then adapted and analysed by NRAs with the aim of identifying SMP (on a forward-looking basis). Where no dominance is found, *ex ante* obligations may not be imposed on any undertaking in the relevant market (*ex post* competition law would still apply). Where dominance is found, the choice of an appropriate remedy must be made from a specified list. The effect of the regime is to create a series of market-by-market ‘sunset clauses’ which reduce the level of *ex ante* regulation as the scope of effective competition expands.

A *Recommendation on relevant markets*¹ identifies those markets which, in the Commission’s view, may warrant *ex ante* regulation. Unlike the previous regime, markets must be defined in accordance with the principles of competition law. NRAs may vary the markets subject to objection by the Commission. Member States can also add markets, using specified (and quite exacting) procedures.

The Recommendation identifies three cumulative criteria for identifying those markets which are suitable for *ex ante* regulation: high and non-transitory barriers to entry over the period of application of remedies, the expected persistence of such barriers to entry beyond that period, making the prospect of effective competition unlikely, and the inability of competition law adequately to address the particular issue. The second of these is simply a projection of the first (albeit difficult to apply in practice). The third, cumulative, criterion is whether competition law is sufficient to address the particular market failure. This has proved particularly contentious when the form of SMP in question has been joint, rather than single dominance.

The first Recommendation identified 18 markets. The draft second version published in 2006, reduces it by a third, notably eliminating most retail markets.

¹ Commission Recommendation 2003/311/EC of 11 February 2003 on relevant product and service markets within the electronic communications sector susceptible to *ex ante* regulation in accordance with Directive 2002/21/EC on a common regulatory framework for electronic communication networks and services. [2003] OJ C 114/45.

Pursuant to Article 16 of the Framework Directive, the regulatory framework only permits the imposition of *ex ante* regulation where one or more undertakings are found to have Significant Market Power (SMP). The definition of SMP is identical to the standard definition of dominance determined and repeated by the European Court of Justice, ensuring in principle a major step forward towards the convergence of approaches under regulation and competition law.

The Commission's *Guidelines on Market Analysis* contain the principles to be used by NRAs in determining whether an undertaking has SMP.² Essentially, to determine whether one or more undertaking has SMP (i.e. whether effective competition is absent), NRAs must evaluate current conditions on the relevant market. Where the analysis indicates an absence of effective competition, the NRA must then examine whether the market may be "prospectively competitive".

Under the Directives, NRAs have the power to impose obligations on firms found to enjoy SMP in a relevant market. Essentially, for wholesale markets the remedies are contained in Articles 9-13 of the Access Directive, while for retail markets the remedies are contained in Articles 17-19 of the Universal Service Obligations Directive. The wholesale remedies are, in ascending order of rigour: transparency, non-discrimination, separate accounting, mandatory access, and cost-oriented pricing. NRAs must act within a framework of duties set out in Article 8 of the Framework Directive and the measures they take must be proportionate to the policy objectives identified. This can be construed as meaning that the intervention is appropriate, no more than is necessary, and, by implication, satisfies a cost-benefit test, in the sense that the expected benefits from the intervention exceed the expected costs. Article 8 additionally specifies policy objectives, but does not go so far as to determine the weights appropriate for use in the cost-benefit analysis. For example, Article 8(2) requires NRAs to promote competition for electronic communications networks and services by maximising users' choice and value for money,

² See *Commission guidelines on market analysis and the assessment of market power* (2002/c 165/03).

eliminating distortions or restrictions to competition and encouraging efficient investment in infrastructure. Further, Article 7(4) of the Framework Directive requires NRAs to promote the interest of EU citizens by, *inter alia*, providing consumers with protection in their dealings with suppliers, and requiring transparency of tariffs and conditions for the use of publicly available electronic communications services

In institutional terms, power is shared between the European Commission, which seeks to harmonise the whole process across the member states and has specific powers of veto over certain decisions and NRAs which implement the measures in their own countries. This is intended to produce a balance between harmonisation and delegation, even though there is disagreement over precisely where it should be struck, at present particularly over whether the commission should have a veto over remedies selected by NRAs.

The modifications to this framework, proposed by the Commission in June 2006, are modest in nature, though they would give the Commission a veto over remedies.³

*B. The key distinction between ECS regulation and European competition law:
procedures for mandating access*

Under European competition law, access by one firm to a competing firm's facilities is available under very strict conditions, established in case law, following a series of judgments. In *Oscar Bronner*⁴ the European Court of Justice set out conditions necessary for access to be mandated on the grounds that a 'refusal to supply' would be an abuse of dominance under Article 82 of the Treaty. The case involved the issue of whether the publisher of a daily newspaper should have access to the home-delivery distribution system of its much larger competitor. The ECJ said that, for there to be an abuse, it had to be shown that a refusal to grant access to the delivery service would eliminate all

³Communication on the review of the EU regulatory framework for electronic communications networks and services, SEC(2006)816-7.

⁴*Bronner (Oscar) GmbH & Co. KG v. Mediaprint*, C-7/97(1998), ECJ

competition in the newspaper market, and that the service was indispensable to carrying on business in that market.

The Commission's *Notice on the Application of the Competition Rules to Access Agreements* states, in similar terms, that 'it will not be sufficient that the position of a company requesting access would be more advantageous if access were granted – but refusal of access must lead to the proposed activities either being made impossible or seriously and unavoidably uneconomic.'⁵

These are tough conditions, and their application is *ex post*. The conditions for mandating access (*ex ante*) under the Directives are much weaker. When SMP has been found in a wholesale market, a number of remedies can be applied, ranging from transparency to mandatory access. The latter is embodied in two separate remedies. In essence, one mandates access at 'reasonable' prices, while the other mandates access at cost oriented prices. These two remedies are now described in more detail.

Article 12 of the Access Directive entitles NRAs to impose on operators with SMP obligations to meet reasonable requests for access to, and use of specific network facilities. An NRA may impose obligations on operators to grant access to specific facilities or services, including in situations when the denial of access would hinder the emergence of a competitive retail market, or would not be in the end user's interests.

This represents an obligation to be implemented in circumstances similar to, but significantly broader than, those in which the essential facilities doctrine is applied under competition law. Simplifying somewhat, the extension of the test lies in the replacement of the precondition under competition law for mandatory access, that the asset is essential and cannot be replicated, by a much broader condition that NRAs can mandate access in circumstances where its denial 'would hinder the emergence of a sustainable competitive market at the retail level, or would not be in the end-user's interest.' However, this

⁵ *Notice on the Application of the Competition Rules to Access Agreements in the Telecommunications Sector* (98/C 265/02) (1998), para 91.

condition has to be squared with an obligation to take account of ‘the initial investment of the facility owner, bearing in mind the risks involved in making the investment.’

The obligation is silent about the pricing of such access, except to the extent that it prohibits ‘unreasonable terms and conditions’ having a similar effect as denial of access. ‘Not unreasonable’ pricing may therefore encompass a range between long run average incremental cost and the retail price charged to end users minus an amount equal to the cost to the access provider of the services which the access seeker now produces itself (so-called “retail minus prices”, which are closely related to prices implied by the efficient component pricing rule or ECPR). Or it could include prices which incorporate in the cost of capital an allowance for the ‘real option’ value to the access seeker of being able to have recourse at will to the access provider’s assets.⁶

Article 13 of the Access Directive entitles NRAs to impose obligations of price control and cost accounting – ie. cost-oriented pricing. The circumstances identified as appropriate for the application of this remedy are ‘situations where a market analysis indicates that a lack of effective competition means that the operator concerned might sustain prices at an excessively high level, or apply a price squeeze, to the detriment of end users.’

As well as operating *ex ante* rather than *ex post* in response to a refusal to supply or a complaint of excessive pricing, such regulation of mandatory access applies in a much more expansive circumstances, and, in one variant, includes a tough cost-oriented pricing rule. This gives NRAs a lot of power. How has it been used for broadband?

Section 2. REGULATING CURRENT GENERATION BROADBAND

This section examines potential market power issues in broadband in the EU as they have emerged over the past four years and as they will continue to develop over the next few;

⁶ This is discussed in M. Cave ‘Encouraging infrastructure competition via the ladder of investment’ *Telecommunications Policy*, April/May 2006, pp. 223-237.

i.e. in relation to current generation broadband. It draws upon a report completed for the Commission on broadband markets for the revised Recommendation.⁷

It is assumed that the relevant retail market is limited to broadband delivered to a fixed location (by whatever technology) at speeds available using versions of ADSL and current cable and wireless technologies. The treatment of higher speed broadband, such as VDSL, is considered in Section 4 below.

A Market power issues in end-to-end retail broadband

The market-place for non-mobile broadband in the EU falls into three categories – 0.X, 1.X and the 2.X models⁸. In certain regions of certain Member States, where fixed networks have not been built, the only platforms available are wireless. The availability and viability of these platforms are open to doubt – hence, collectively, they score 0.X. Other Member States have in addition universal coverage of a fixed telecommunications network which can be enabled for ADSL for almost all exchanges/subscribers, as well as the wireless platforms. These score 1.X. Finally, other Member States, in part or all of their territories, have in addition a cable network capable of providing broadband; hence 2.X.

Unregulated, the 0.X and, particularly, the 1.X market structure could easily exhibit single dominance on an end-to-end basis, without access regulation. Joint dominance by ADSL and wireless is also possible, but the different cost structures of wired and wireless platforms make tacit collusion less likely.

On the basis of national market definitions, relatively few Member States (Belgium, the Netherlands) have near universal cable/ADSL competition, in addition to whatever competition will be available from wireless. In the absence of strong competition provided by wireless technologies, the possibility of joint cable/ADSL dominance cannot

⁷ M. Cave, U. Stumpf and T. Valletti, *A review of certain markets included in the Commission's Recommendation on relevant markets subject to ex ante regulation*, June 2006.

⁸ This is a small adaptation of a classification introduced by Eli Noam.

be ruled out.⁹ There are thus grounds for anticipating market failure problems (i.e. SMP) in non-mobile retail broadband markets.

Overall, then, there are good grounds for anticipating market failure problems (up to and including dominance) in non-mobile retail broadband markets, in the absence of regulation, and hence for intervening in wholesale markets if the SMP found there satisfied the conditions of persistence and non-susceptibility to competition law.

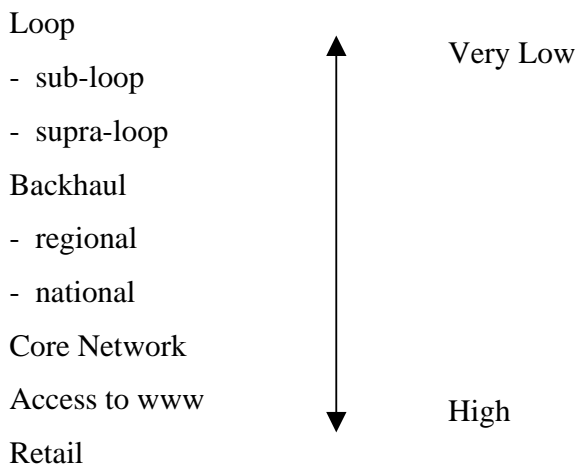
B Wholesale broadband markets

Where an ‘unregulated’ dominance problem has been identified on an end-to-end (so-called ‘modified greenfield’) basis, the next step normally adopted is to identify the least replicable element of the value chain- the one which a competitor will find it hardest to construct-establish a corresponding market definition make a market analysis and devise a remedy. The process is repeated for the next least replicable component of the chain, in addition to the least replicable element already included. That market definition, once established, is tested for SMP on the hypothesis that the previous market is subject to remedies. And so on, until the last component of the value chain, typically the retail margin is investigated, unless the process comes to a halt earlier.

Figure 1 below shows a generic representation of a general value chain for broadband. The value chain is arranged in what is assumed to be increasing ease of replicability (from the top).

⁹ As noted above, joint dominance problems might be better tackled by competition law.

Figure 1. The Broadband Value Chain and Ease of Replication



The discussion in this section will focus on ADSL and cable technologies, on the footing that 3G and other mobile services (as noted above) fall in a separate retail market (although they use similar network elements at higher levels in the hierarchy) while fixed wireless broadband is regarded as a technology in the same market, for which (however) market share and other projections are highly doubtful.

Where no cable network is available or likely to be built, there can be little doubt that the local loop offers an indispensable route which competitors need to gain access to retail customers, on the assumption that wireless technologies will not emerge in sufficient strength over the period in question to replicate the copper loop.

Where a cable system operates, it may be technically feasible to supply the equivalent of an unbundled loop, but in practice any constraint it can apply on the price of a loop will be indirect, via the retail market.

In July 2006, entrants' DSL lines in the EU based on unbundled or shared loops exceeded those based on bitstream in the proportion 3:1.¹⁰ But in only one Member State, the Netherlands, has effective competition been found in (part of) their wholesale broadband access market place. Moreover, the ERG analysis of broadband regulation emphasises

¹⁰ European Commission, *12th Implementation Report*, pp 70.

the importance of intermediate wholesale products as a stepping stone or rung in the ladder towards local loop unbundling¹¹. However, in significant parts of many member states, competitors have built out to local exchanges and duplicated much of the bitstream product. Regulators' failure to take account of this is likely to have an adverse effect, even if it arises from reluctance to distinguish different geographies.

Section 3. EVALUATING THE EFFECTS OF REGULATION OF CURRENT GENERATION BROADBAND

This is attempted in two ways – by looking at the econometric evidence, and at the pattern of broadband development in the EU.

A. *Econometric studies.*

Several studies have been made of the consequences for the spread of broadband of access regulation. Some use US state-level data, but this account focuses on two which have a broader international sample.

The authors of the first study develop a model of competing platforms offering different types of broadband services.¹² According to their model, a low price for loop unbundled loops raises broadband penetration and does so more effectively the less concentrated is the DSL market. Both intra- and inter-platform competition increase take-up, but in a less concentrated platform market, inter-platform competition is better at stimulating broadband uptake than intra-platform competition.

¹¹ *Broadband Competition Market Report*, ERG (05) 23, 2005.

¹²W Dispasio, P Lupi and F Manenti, "Platform Competition and Broadband Uptake : Theory and Empirical Evidence from the European Union" *Information Economics and Policy* 18(1) March 2006

The model is estimated on 158 quarterly observations drawn from 14 EU countries for Q4 2000 to Q2 2004. The authors conclude that ‘while stimulating entry into the DSL segment of the market through appropriate regulatory policies, such as local loop unbundling, is generally less problematic than enticing entry into alternative platforms (typically cable and fibre optics), it is still very much unclear which is the most effective way to proceed in order to speed up broadband adoption’. The key result is that inter-platform competition is significant while intra-platform is positive but small and insignificant.

The second paper, by Wallsten, uses ITU and OECD data to compile a panel dataset for 30 OECD countries over five years (1999-2003).¹³ The equation estimated relates broadband penetration to the existence of three forms of unbundling – ULL, bitstream and so-called sub loop unbundling (which is essentially a resale product); the form of wholesale price regulation in place; the form of collocation required for ULL (internal, removed, virtual, etc.) and a range of demand-side variables. There is no direct reference to the degree of inter-platform competition, so the degree of cable competition going on in the background is ignored. The conclusions are as follows:

- a resale product is always significant and negative (it harms diffusion over the sample as a whole)
- bitstream is positive and statistically significant in some regressions; insignificant in others,

¹³ Wallsten, Scott, *Broadband and unbundling regulation in OECD countries*, AEI Brookings Joint Centre on Regulation, Working Paper, 09-16, 2006.

- LLU is positive and significant in some regressions; positive and insignificant in others; negative and significant in one.

Wallsten also investigates the determinants of download speeds, recognising the difficulty of measuring them. No type of unbundling seems to effect them.

The author's conclusion is that 'regulations matter and some appear to be beneficial while others are harmful.' In particular, more limited unbundling does better than more comprehensive variants, with resale doing uniformly badly.

It is difficult to derive conclusions based on these studies alone¹⁴, but they may point to the following propositions, which are supported by other analysis.

- the 'best' form of competition for diffusion (and end-user welfare) is platform competition across the whole value chain/ladder of investment.
- incompetent access regulation can harm diffusion
- targeted and well-designed access regulation can enhance it.

¹⁴ See also two papers using US data: F. Dennis, and H. Gruber, *The definition of broadband telecommunications: the role of competition*, Universita degli studi, Roma Tre and Scott Wallsten *Broadband penetration : an empirical analysis of state and federal policies*, AEI Brookings, Joint Center Working Paper, 05-12-2005.

B. *Output growth*

According to devotees in the ‘ladder of investment,’ access regulation should be varied over time to encourage competitors to invest progressively more deeply in the network and to encourage the incumbent to look to its laurels and invest too. This proposition has received some support from the observed behaviour of Tele2, which explained its take-over in early 2006 of Versatel, a Dutch cable operator, on grounds that

“Tele2 is pursuing its strategy of backward integration into infrastructure in markets where it has a critical mass of customers. Owning local access infrastructure is increasingly important in the growing ADSL market to ensure higher margins on access, better control of customers and ability to deliver higher margin services. Tele2 fully endorses Versatel’s triple play strategy and will aim to leverage this expertise to later introduce these services in other core markets.”

Has this worked in practice? One way of investigating this issue is to examine EU investment data. A recent study from the Commission has computed investment levels in ‘e-communications’ in EU member states.¹⁵ The period covers 2001-2004. The relative levels of investment in the various subsectors are shown in table 1:

¹⁵ London Economics, in association with PWC, *An account of the regulatory framework for electronic communications: growth and investment in the EU e- Communications Sector*, July 2006.

Table 1. Investment levels 2001-2004 (€bn) and shares of total investment

Fixed telecommunications	74.0 (47%)
Mobile telecommunications	69.8 (44%)
Cable	6.4 (4%)
Broadcasting	8.3 (5%)

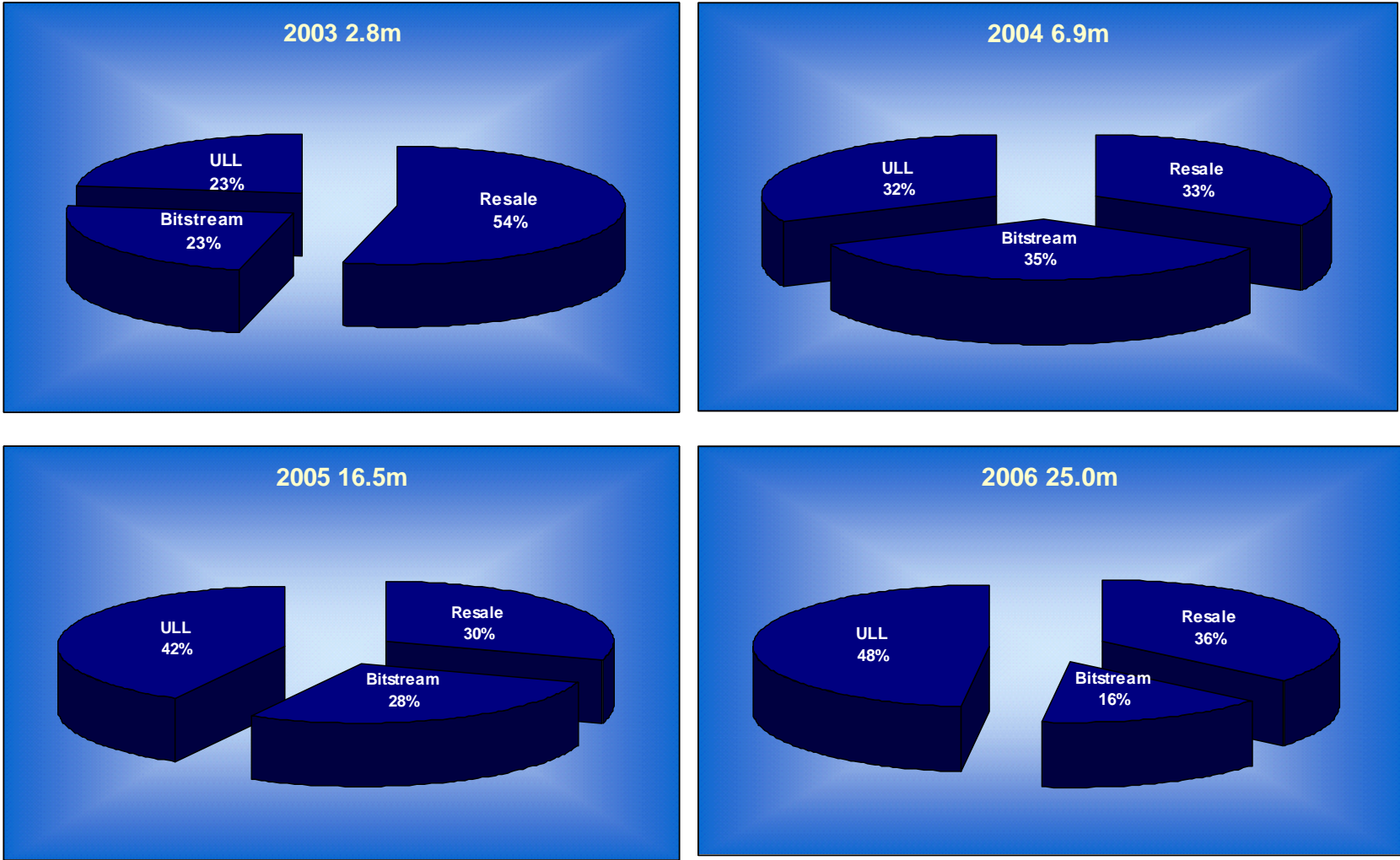
Table 2 shows the startling growth of broadband subscribers in the 15 states which were members in 2003. Note the relatively poor performance of cable broadband, subscribers to which doubled in a period while DSL subscriptions more than quadrupled. It is also noteworthy, and consistent with the ‘ladder of investment’ approach, that the proportion of ‘competitive’ (ie, non-incumbent) broadband lines accounted for by unbundled loops grew from 25% in 2003 to 40% in 2006, while that accounted for by resale fell from 5.4% to 36% (see figure 2). Interestingly, bitstream seems to have been caught in the middle. In short, infrastructure competition seemed to be on the march.

Table 2. Diffusion of Broadband in the EU15 (millions of subscribers)

	2003 (July)	2004 (July)	2005 (October)	July 2007
DSL, of which	12.5	22.5	40.8	56.4
Incumbent	9.6	15.6	24.3	31.4
Non-incumbent	2.8	6.9	16.5	25.0
based on				
Resale	1.5	2.3	4.9	9.1
Bitstream	0.7	2.4	4.6	3.9
ULL	0.7	2.2	6.9	12.0
Cable	4.1	5.6	8.2	10.1
Other technologies	0.9	0.7	1.1	1.3
Total	17.5	28.8	50.1	66.3

Source: EC, *Implementation Reports*

Figure2.



Section 4. REGULATING ACCESS TO IP-BASED NETWORKS

A. IP-based networks

Traditional fixed telecoms networks are typically characterised by the deployment of fibre in core networks and mainly of copper in access networks (with large business customers served directly with fibre), and with multiple platforms supporting the provision of various services, such as circuit-switched voice and a variety of data services. The nature of established networks has been borne of an evolutionary process, with telecoms operators responding to changing demand and incrementally improving and upgrading networks in response to technological advancements.

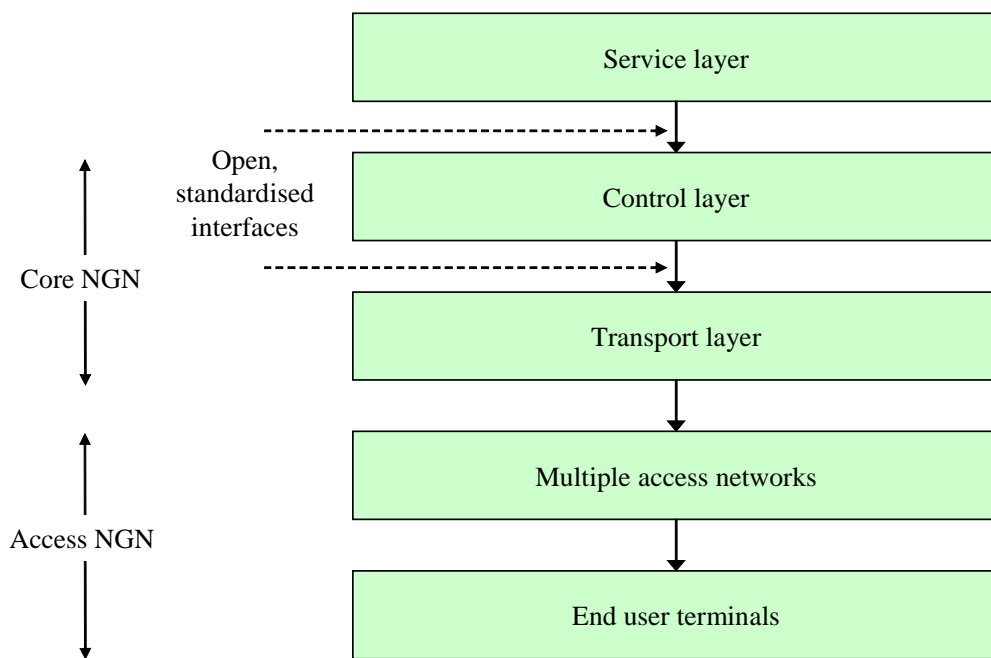
Recent years, however, have seen the proliferation of the internet and the increasing demand for ever-higher bandwidth from end users, leading operators to seek ways to enhance the capacity of their existing networks. Whilst Fibre to the Home (FTTH) roll-outs have been considered in the past, their prohibitive cost led operators to look to alternative ways of utilising existing copper access networks, which has led to the development and proliferation of ADSL technologies for residential end users, broadband internet access and, for business customers, more flexible and higher capacity networking services.

Looking forward, fixed operators are facing end-user demand for ‘converged services’, incorporating internet, telephony and IPTV as well as other services which cannot in many cases be supported by existing telecoms networks and technologies. This – along

with improved cost efficiency in the face of increasing competitive pressure – is a driving factor behind the plans of telecoms operators to develop and deploy IP-based networks.

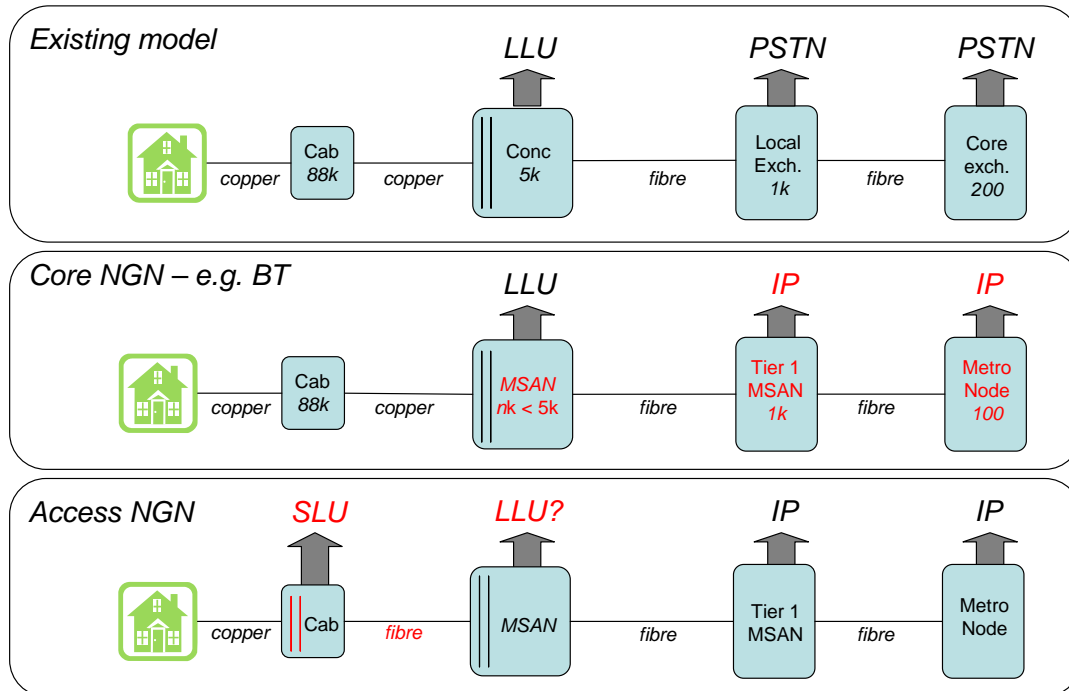
Figure 3 below summarises the structure of a typical IP-based network.

Figure 3. The structure of an IP-network



In general terms, there are two forms of IP-based network development for fixed network operators which are represented as NGNs: the 'core NGN' and the 'access NGN' as stylised in figure 4 below.

Figure 4. Network Architectures



The 'core NGN' involves the replacement of existing core network switching and transmission equipment with IP-based routers capable of supporting Voice over IP (VoIP), multimedia and other packet-based services. This will involve the significant rationalisation and simplification of the existing core network structure with the deployment of fewer nodes and prospectively fewer points of interconnection, as well as the distribution of network intelligence (e.g. routing and signalling) towards a core structure of 'soft switches' and routers and away from the traditional model characterised by various switches network elements towards the outer reaches of the network. Multi-service access nodes (MSANs) replace the existing range of access equipment required by the different networks in order to connect end users to the core network and provide telephony and broadband from a single platform.

The ‘access NGN’ typically involves investment in deployment of fibre deeper into the access network (for example Fibre to the Node¹⁶ or FTTN) in order to provide higher speed access to end users and potentially encourages competitive access through ‘sub-loop unbundling’ (SLU) at the street cabinet – potentially instead of current local loops from the Main Distribution Frame (MDF) which is commonly situated at the local exchange or remote concentrator. (In other words, the local exchange or concentrator can be by-passed.)

Fibre deployment closer to the end user allows for higher access speeds (since there exists a negative relationship between the length of copper over which the DSL technology is deployed and the achievable bandwidth) through the deployment of high-speed access technologies over the remaining last-mile copper network such as ADSL 2+ and VDSL.¹⁷ For example, speeds of up to 52 Mbit/s (compared with a maximum ADSL speed of 8Mbit/s) can be achieved consistently with VDSL over 0.3 km, with this falling significantly to 13 Mbit/s over the maximum operating distance of VDSL of approximately 1.3 km. In contrast, ADSL can, although at significant slower speeds, operate up to distances in excess of 5 km, allowing for deployment at the majority of local exchanges as opposed to requiring investment in fibre closer to the end user premises. Fibre is also in some cases being deployed directly to the customer premises, in particular into multiple occupancy dwellings such as blocks of apartments¹⁸, although, across Europe, DSL technologies will represent the predominant access technology.

B. Regulation of fibre access outside Europe

As always with access issues, the questions are: whether to mandate it; what pricing principle should be employed, and where to mandate it. First I briefly describe some recent experiences of regulation outside Europe.

¹⁶ The node is typically the street cabinet.

¹⁷ ADSL2+ and VDSL (Very high speed DSL) are recently developed variants of DSL technology.

¹⁸ For example, 50% of Japanese end users have access either to VDSL or Fibre to the Home (FTTH), with the Government’s ‘e-Japan’ national plan aiming to establish Japan as a ‘fibre optic nation’ by 2010; the Government’s objective is to bring fibre to 30 million homes at a rate of 3 million per year.

In the *US*, the FCC made clear in 2001 that it would forebear from regulating fibre deployments for at least five years. This was followed by substantial fibre deployment to the home, especially by Verizon, and to the cabinet by other Bell companies, in the context of competition between those companies and cable.

In *Australia*, the announcement by Telstra of plans to deploy fibre to the cabinet or node (FTTN) in major cities precipitated an acrimonious dispute with the regulator. Telstra sought immunity from regulation for a period, but the ACCC indicated that it would likely declare the assets liable to mandatory access, but that it was willing to give an indication in advance of an appropriate risk-adjusted rate of return as it recognised, in the Chairman's words, that 'the ACCC accepts that Telstra should be entitled to recover its actual costs arising from the FTTN upgrade,' and that 'the ACCC accepts that Telstra faces a significant risk that should be reflected in the cost of capital used to calculate access prices.' The debate became bound up with the government's plan to privatise the final segment of Telstra's shares, and it appears that the company was seeking to use this imminent event as a lever to gain the immunity from regulation which it sought. The discussions on rate of return were confidential but it is believed that the ACCC proposed an augmentation of its standard cost of capital from 8.9% to 10.3%.

In the event, Telstra announced in early August 2006 that it was cancelling its plans to make the investment. The Minister of Communications subsequently commented that 'the impediments didn't appear to be apparent until right at the end of the process. So I think that there may be in those circumstances an opportunity to revisit the issue.' At the end of 2006, Telstra acknowledged this, but in April 2007, its chief executive noted at a decision was 'not close'.¹⁹

C. Regulating access in the EU: market definition

This discussion begins with the leading case which regulators have had to consider. In *Germany*, the incumbent proposed a significant investment in installing fibre to the

¹⁹ *Broadband off the boil (for now)*, ABN AMRO Equities, Australia, 20 April 2007.

cabinet, or VDSL, in major cities. The issue of access has fallen to be considered in the context of the current regulatory arrangements. These require the regulators to address the following sequence of questions.

First, are the retail services provided by the new access network in the same market as those provided by ADSL in its more or less advanced variants? This ultimately depends upon whether the new network is needed to supply new services requiring speeds which cannot be supported by earlier technologies. Such services might be advanced interactive gaming applications or multiple high definition video services.

If the new network does sustain new services, then the presumption against regulating 'emergent services' should be invoked. That is to say, in the interests of promoting investment in new technologies, regulators should forebear until the market has ceased to be emergent, and become established. There is obviously room for debate about when that might be.

What if the new network supplies the needs of both 'old' and 'new' end-user services, and is dominant in the provision of wholesale input for the former? In these circumstances it may be appropriate to conceive the NG access network as bundling two wholesale inputs – one at conventional speed and subject to regulation, the other at higher speed, providing services for an emergent market. In principle, only the former can be subject to mandatory access, although deciding a suitable price for attenuated rights of access by competitors to a new high speed network would be problematic.

It is a corollary of this approach that if the new network is not meeting the needs of new services, in other words, if it is a 'process' rather than a 'product' innovation, then it would likely fall into the same market as existing access services, and, in the presence of dominance be subject to *ex ante* regulation.

Precisely this approach was taken by the European Commission. The operator, Deutsche Telekom, initially persuaded both the German Government and the regulator, BNetzA,

to forbear from regulating the new development, particularly from making access to it by competitors mandatory. However the European Commission, on being notified of the analysis, observed that:

‘The Commission notes that emergence of new retail services may give rise to the emergence of a new derived wholesale market to the extent that such new retail services cannot be provided over the existing wholesale products. The new retail services maybe in such a case generate a wholesale demand for broadband access services. Such new wholesale products should not be subjected to inappropriate obligations.’

However, as the Commission considered that new services were not likely to be available, it concluded that services from the VDSL network would fall in the broader market involving ADSL and other technologies. The regulator renotified in this sense. Even so, the German Parliament is currently considering legislation which would preclude intervention, the legality of which will probably be determined by the European Court.

D. Regulating access in the EU: finding SMP

The next issue, though, is whether Deutsche Telekom exhibits SMP in this larger market. Apart from competition from so-called ‘city services’ relying on unbundled DT loops, there are also cable networks, passing 80% of German homes. These cable companies were only horizontally separated from DT in a process completed in 2004. But will they impose a competitive constrict in the future?

This opens up the key question on access regulation. To what extent can Europe in 2.X areas achieve the arguably competitive outcome now observable in the United States (and hence deregulate)? Put more challengingly, does easy access by competitors to telecoms networks deter cable investment, as may have happened in the US before deregulation?

In the US cable has been notoriously profitable. Despite intermittent and generally unsuccessful attempts at regulation, cable assets have regularly changed hands at well above their build costs; the operators have therefore had the financial assets necessary to maintain broadband competition with telecoms operators, to profit from voice over broadband, and to make upgrades.

European cable operators, by contrast, have been in dire straits. This was illustrated by table 1 about which compares their investments from 2001-2004 with those of fixed and mobile telecoms operators and broadcasters. With the exception of Spain, where an energetic and newly consolidated cable operator is enlarging coverage at a rapid rate (from 20% of homes passed in 2000 to 50% in 2006), their prospects for expansion look bleak. In the UK they are likely to continue to face the debilitating consequences of a platform competitor with a dominant position in wholesale premium programming, which also relies on free spectrum.

But what should the test be? In a recent paper, Alfred Kahn endorsed a proposal that there should be no access regulation wherever and whenever a second facilities-based carrier has taken over some specified percentage of the subscriber access lines of an incumbent telephone company, in a market geographically defined by the reach of the facilities of the (presumably cable) competition.²⁰ In the proceeding which he describes, and in which he participated, the incumbent proposed a 5% threshold. Kahn notes that such a low threshold can be justified by both, the very large sunk investments and low marginal costs of the competition, which would deter exit after even such a low share and the fact that the sector is characterised by dynamic Schumpeterian competition.

The European Directive eschews such a 'rule of thumb' or 'bright line' approach, favouring instead a prospective market analysis taking individual circumstances into account. As noted above, so far this has resulted in only one partial national finding of

²⁰ A. E. Kahn, 'Telecommunications: the transition from regulation to antitrust'. *Journal on Telecommunications and High Technology Law*, 5 (2006): 159-188.

‘effective competition’ in wholesale broadband access, in the Netherlands, where numerous operators have built out to KPN’s local exchanges, and home in the local loop.

To some extent, this is likely to be due to the current universal practice by European NRAs of defining markets and imposing remedies on national markets, including both cabled and non-cabled areas.

The standard test for a geographical market – homogeneity of competitive conditions within it – tends to yield national markets when there is a ‘patchwork quilt’ of alternative infrastructures joined by reliance on uniform retail pricing imposed by the regulator on the incumbent. But this story generally does not work for broadband, the retail price of which is not regulated. This is a strong argument for permitting differentiated geographical treatment, either at the stage of market definition or of remedies. The feasibility of doing this has been demonstrated in New Zealand, where the geographical scope of access regulations change almost in real time, as competitive build out occurs.

If this step is taken, will (or should) NRAs deregulate in 2.X areas? It is not hard to envisage regions where this might be appropriate, for example in Milan or Brussels. Whether NRAs in Europe will seize this opportunity is more doubtful, as there is a high probability it might lead to unpopular price differentiation, the risk of collusive behaviour in the long-term (which could, however, be attacked by competition law), and a possibility that the consequential tougher competition will destroy nascent or more fragile alternative networks. Nonetheless it is a risk worth taking.

But this leaves considerable scope for access regulation in 1.X areas – about 50% of the EU total. I end this section by considering briefly how this might best be accomplished in an IP world.

E. Pricing fibre access

This issue has been noted in relation to Australian regulation. Deployment of fibre to the cabinet or to the home involves risks – both on the demand side and the execution side.

The cost of capital can legitimately incorporate them, in either of two ways:

- the first is the standard method of identifying project specific risk by calculating NPVs in alternative scenarios, to which probabilities are assigned;
- the second is the more sophisticated method of real options, in which the same risks are assessed in the context of an irreversible investment with a continuous distribution of outcomes, in ways which implicitly price the costs of ‘not waiting’ to make the investment.

Either of these methods – but not both together – can provide an appropriate adjustment to the cost of capital. Bearing in mind particularly the ‘high end’ initial estimates of the real options, which double or triple the allowable returns, the risk-related augmentation apparently under offer in Australia – of 1.4% pa – may seem very small. But it must be remembered that

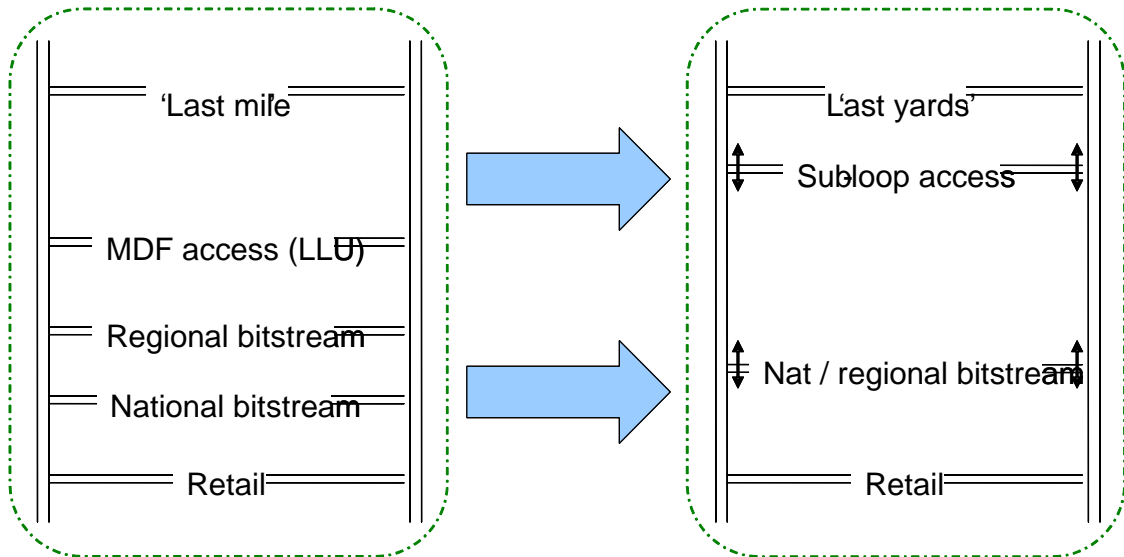
- a) not all investment is irreversible
- b) in a sequential roll-out, execution risk and to some degree, demand-side risks will abate quite quickly, leaving only early tranches of investment eligible for a risk premium.

F. Where to interconnect in an IP Network

The most problematic regulatory issue comes last, and may under the pricing discussion moot. Figure 1 above discloses, under the current regime, three feasible points of access for current generation broadbands generating three access products – unbundled loops, regional bitstream and national bitstream. This creates a relatively multi-runged ladder (see Figure 5 below, left). Switching to IP and fibre, creates a less hospitable ladder with fewer rungs (see figure 5, right), with serious foreseeable problems in relation to sub-loop access, of both a technical kind (where to insert competitors’ equipment) and of a

commercial kind (can so small a group of customers served support competitors' investments²¹).

Figure 5. Changes in access points



While current generation broadband has provided a convenient sequence of incremental investments which competitors can make. The relevant alternatives now seem to be the sub-loop or the metronode or similar point high up in the network and remote from the end-user. Unless this issue can be resolved, without the invention of new artificial entry points designed to make NGNs fit into the Procrustean bed of the PSTN, the focus on intraplatform competition will be threatened.

Section 5. CONCLUSIONS

This account of the growth of broadband fails to provide unambiguous policy conclusions concerning the desirability of access regulation. There are good theoretical reasons for believing that full end-to-end competition will benefit end users, and stronger empirical support for the related view that a policy of mandating resale is not beneficial. However,

²¹ For a (probably) negative answer to this question, see The business case for sub-loop unbundling in the Netherlands, OPTA, January 2007.

other forms of mandated seem to be beneficial. In these circumstances, what should European regulators and policy makers do within the framework of the current regulatory regime (which is unlikely radically to be revised from 2010).

Firstly, it seems inappropriate to maintain the current almost universal practice of ignoring regional differences within member states in the availability now of cable networks, and in the future of wireless networks. Market analysis and the discussion of remedies must take account of, for example, the presence of Fastweb in Northern Italy, of NTL in half of the UK and (prospectively) of Iliade's proposed fibre network in Paris. Conducting analyses of regional markets will be a difficult process which regulators will seek to avoid, but it is necessary.

This should provide a better framework of evidence for the difficult decision which will have to be made over whether a cable/ADSL duopoly, supplemented by some present or prospective wireless competition, is adequate to protect consumers. The US experience provides significant but not compelling evidence on this issue: significant investment by cable and telecommunications firms has taken place, but the expansion of broadband has been comparatively muted by European standards since 2003. The recent investment history of European cable firms is poor, but there are signs of recovery which should be encouraged, notably by the elimination of asymmetric regulation upon them (such as onerous 'must carry' rules, which require them to deliver at no charge a variety of programming which either they would carry in any case for commercial reasons, or which attracts very low audiences. What regulators should be particularly concerned about is evidence that cheap and easy ADSL access via resale and bitstream, by indirectly putting a cap on retail broadband charges, has removed cable investment incentives; in other words that there is potential for prospective end-to-end competition which is not being realised.

The choice is not a binary one between maintaining or eliminating all access regulation, thereby effectively wiping out ADSL competitors. Intermediate steps can be considered, such as the elimination of lower rungs (or even some upper rungs, such as shared lines) in

the ladder or reviewing relative access prices. It is also important to emphasise that competitive ADSL providers are making voluntary commercial investments in the midst of significant market and technological uncertainties. They are fully entitled to protection from anti-competitive practices, but not from the stranding of their assets as a result of innocent behaviour by the incumbent.

Thus current ADSL competitors will be shortly be confronted by the challenge of new network architectures based on IP and fibre. Access options will change, possibly offering a difficult choice between reverting to something akin to resale (which might be withdrawn) or a major investment in a competing fibre. It would be a mistake for regulators to perpetuate the current known world of bitstream, full loop unbundling etc. in the presence of such a disruptive change.

These circumstances imply a policy of facilitating fuller infrastructure competition, by freeing spectrum, removing any disadvantages cable companies face, and possibly considering mandating access to basic infrastructure such as ducts rather than traditional communications assets, such as copper or fibre.

These measures can create a framework of expectations in which European NRAs can be forced to reassess their access policies, and, where appropriate, to deregulate. Unfortunately, the traditional policy of indulgence towards entrants will discourage making hard decisions, and greater involvement in remedies by the Commission may be needed to achieve the potential for a further major push towards expanded infrastructure competition.