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**REGULATORY ISSUES IN ESTABLISHMENT AND MANAGEMENT OF
COMMUNICATIONS INFRASTRUCTURE: THE IMPACT OF NETWORK
CONVERGENCE¹****1 INTRODUCTION**

The communications industry is network-based.² Providers of communications services need to set up or have access to an infrastructure (e.g., a network capable of transmitting electronic signals) in order to be able to provide services on the market. With the advent of digital technology in recent years the performance of communications infrastructures has been considerably improved and this will continue at an even faster speed in the years to come.³ A growing degree of network substitutability is to be anticipated where a range of alternative networks will be used to provide not only traditional telecommunications or broadcasting services but also new multimedia services.⁴

The establishment and management of communications infrastructure not only involves technological challenges, but also raises a range of regulatory issues which will be examined in this paper. These issues are both important and complex. First, the communications industry is extremely sensitive to the regulatory environment. The decisions that are driving network development are based on business plans largely influenced by the current or anticipated state of regulation.⁵ Moreover, there is not a single obvious approach to communications regulation. Often, regulators will face regulatory dilemmas. One classic example of such dilemma is whether one wishes to promote facilities-based competition (by adopting measures encouraging investment in

¹This paper was produced for the ITU Workshop on the Regulatory implications of broadband by Damien Geradin & Christophe Humpe. It, and other documents from the Workshop, can be found at www.itu.int/broadband. The opinions expressed in this paper are those of the authors and do not necessarily represent those of the ITU. Damien Geradin is Associate Professor of Law at the University of Liège and Director of the Regulation of Network Industries Project <www.ulg.ac.be/ieje.nip>. Visiting Professor at the College of Europe, Bruges and at UCLA School of Law. Christophe Humpe is Teaching assistant, College of Europe, Bruges

² See OECD, *Global Information Infrastructure - Global Information Society (GII-GIS): Policy Requirements*, 1997, Paris.

³ Digitalisation makes it possible for any type of message to be reduced to a numerical format thus prompting the development of more sophisticated means of data treatment.

⁴ See, e.g., "Regulatory Implications of Broadband", background paper prepared for the workshop on the Regulatory Implications of Broadband, ITU, Geneva, 2-4 May 2001.

⁵ See J. Tompkins et al., "The Role of Optical Fibre in Future Networks", (2000) 2, *Info*, 111, at 120.

competing infrastructures) or service-based competition (by allowing resale or unbundled-network-elements (UNE)-based competition). On this issue, countries have taken different policy options. While the United Kingdom has placed great emphasis on encouraging the development of alternative infrastructures to provide telecommunications (e.g., cable), most other European countries have attempted to maximise the use of existing infrastructures.⁶ A related policy dilemma is often labelled under the heading of regulatory symmetry vs. asymmetry between the incumbent and new entrants. While some experts argue that a fully symmetric approach will lead to economic efficiency, others consider that regulatory asymmetries can, in certain policy areas, help manage the transition towards optimal market structures.⁷

This paper is divided into five parts. Before engaging in any discussion over regulatory policy in any given sector, we believe it is important to identify the situations where some degree of regulation might be needed. Reliance on free markets is generally understood to be the best way to allocate resources and to provide for technological and commercial innovation, as well as consumer satisfaction.⁸ Competition is thus to be preferred to regulation. Yet, in Part II, we explore why the establishment and management of communications infrastructure might require some degree of regulatory intervention. As will be seen, besides achieving some social policy objectives, the core rationale for regulation is to control market power. Regulation should therefore have a limited scope. In the absence of market power (i.e., when the market in question is competitive), there is no need for regulation. Part III tackles the main regulatory issues regarding communications infrastructure. A distinction is drawn between issues linked with the control of access to the market (i.e., licensing) and those linked with the control of behaviours on the market (i.e. interconnection, unbundling of the local loop and cross-subsidisation). Part IV examines the impact of convergence on telecommunications regulation. Finally, Part V contains a short conclusion.

2 OBJECTIVES AND INSTRUMENTS OF REGULATION OF COMMUNICATIONS INFRASTRUCTURE

Most experts consider that the two main rationales for regulation are: (i) to maximise economic efficiency by controlling market power ("economic regulation") and (ii) to ensure the provision of universal service obligations as well as the enforcement of some consumer and environmental protection requirements ("social regulation").⁹ This paper essentially addressing economic regulation aspects, it is on this regulatory rationale we will hereafter focus.

According to one expert, economic regulation involves two different tasks.¹⁰ The first is that of *regulating monopoly*, which involves "mimicking the effects of market forces through implementing controls on prices and on services".¹¹ Though telecommunications markets around the world are now subject to liberalisation, this task remains of some importance.¹² First, one

⁶ See T. Kiessling and Y. Blondeel, "The EU Regulatory Framework in Telecommunications", (1998) 22, *Telecommunications Policy*, 571, at 572.

⁷ Id. at 573.

⁸ See B. Wellenius and P.A. Stern (eds.), *Implementing Reforms in the Telecommunications Sector - Lessons from Experience*, World Bank, Washington D.C., 1994.

⁹ See T. Prosser, *Law and the Regulators*, Clarendon Press, Oxford, 1997, 5. See also, A. Ogus, *Regulation - Legal Form and Economic Theory*, Clarendon Press, Oxford 1994; C. Mc Crudden, "Social Policy and Economic Regulators: Some Issues from the Reform of Utility Regulation", in Mc Crudden (ed.), *Regulation and Deregulation - Policy and Practice in the Utilities and Financial Services Industries*, Clarendon Press, 1997.

¹⁰ See Prosser, supra note 8, at 5.

¹¹ Id.

¹² For instance, in the European Union, it took almost ten years to the European Commission to liberalise all telecommunications services. See P. Larouche, "Telecommunications", in D. Geradin (ed.), *The Liberalization of State Monopolies in the European Union and Beyond*, Kluwer Law International, 2000, at 15.

traditional feature of liberalisation programmes is that they tend to be progressive. Thus, while some market segments will be opened up for competition, others will remain under monopoly control for some time. Moreover, as long as the incumbent retains market power, some forms of regulatory intervention, such as price or quality controls, may be desirable.¹³

The second task is that of *regulation for competition*, which involves "creating the conditions for competition to exist and policing it to continue to exist".¹⁴ This aspect of regulation usually requires adoption of a wide range of regulatory requirements, such as, for instance, fixing the conditions for interconnection between competing but interdependent networks, imposing unbundling of the local loop requirements on the incumbent local exchange operators, and enforcing accounting separation and cost allocation rules (e.g., to prevent abusive pricing practices). In some instances, these pro-competition regulatory requirements are of an asymmetrical nature in that they bear more heavily on certain (usually the incumbent) telecommunications operators.

The preceding paragraphs suggest that the regulatory regimes applying to the establishment and management of communications infrastructure should not exceed what is required to control market power. Thus, as long as there is little or no competition on the market for the provision of communications infrastructure, some regulation will be necessary to control the behaviour of the dominant player(s). By contrast, as soon as a sufficient degree of competition has taken place on such a market (e.g., because there are a number of possibilities for competitors to install alternative infrastructures), regulation should be streamlined or even withdrawn. Of course, a difficult policy decision is to decide when there is "sufficient" network competition to justify the rolling back of regulation.¹⁵

A variety of legal instruments can be used for regulating communications infrastructures. In most countries, communications infrastructures are regulated through sector-specific regulation implemented by sector-specific regulatory agencies.¹⁶ In the United States, for instance, communications infrastructures are regulated by the 1934 Communications Act (as amended by the 1996 Telecommunications Act) whose provisions are implemented by the Federal Communications Commission (the "FCC").¹⁷ In some rare instances, governments have sought to control market power in communications through application of industry-wide competition rules. The attempt of the New Zealand government to create a competitive telecommunications market by exclusively relying on competition rules did not, however, prove successful.¹⁸ It led to protracted litigation which eventually failed to provide a satisfactory solution.¹⁹ This helps to explain why most States involved in telecommunications market opening reforms have decided to adopt some degree of sector-specific regulation.²⁰ Nevertheless, as will be seen below, the progressive disappearance of bottlenecks due to convergence and other technological advances should lead to a progressive

¹³ On price controls, see K. Viscusi et al., *Economics of Regulation and Antitrust*, 2nd Ed. 1995, MIT Press, p. 308.

¹⁴ See Prosser, *supra* note 8, at 5.

¹⁵ D. Ypsilanti and P. Xavier, "Towards Next Generation Regulation", (1998) 22 *Telecommunications Policy*, 643, at 654.

¹⁶ See M. Kerf and D. Geradin, "Controlling Market Power in Telecommunications: Antitrust vs. Sector-Specific Regulation - An Assessment of the United States, New Zealand and Australian Experiences", (1999) 14 *Berkeley Technology Law Journal*, at 919.

¹⁷ On the US system, see P. Huber et al., *Federal Telecommunications Law*, 2nd Ed., Aspen Law & Business, 1999.

¹⁸ See, e.g., M. Webb and M. Taylor, "Light-Handed Regulation of Telecommunications in New Zealand: Is Generic Competition Law Sufficient?", 2 (Winter 1998/99) *International Journal of Telecommunications Law and Policy* 11.

¹⁹ See, e.g., Carl Blanchard, "Telecommunications Regulation in New Zealand - The Court of Appeal's Decision in *Clear Communications v. Telecom Corporation*", 18 (1994) *Telecommunications Policy* 725; Carl Blanchard, "Telecommunications Regulation in New Zealand - Light-Handed Regulation and the Privy Council's Judgement", 19 (1995) *Telecommunications Policy* 465.

²⁰ See D. Geradin, "Institutional Aspects of EU Regulatory Reforms in the Telecommunications Sector: An Analysis of the Role of National Regulatory Authorities", (2000) 1 *Journal of Network Industries* 5, 10.

relaxation of the sector-specific regulatory frameworks and a greater reliance on competition rules and principles.²¹

3 CORE ISSUES OF REGULATION OF COMMUNICATIONS

In this Part, we examine the regulatory issues associated with controlling access to the market (Section 3.1) and those associated with controlling behaviours on the market (Section 3.2).

3.1 Controlling access to the market

Two issues are examined here: (i) the rationales for awarding licences and the principles governing the award of licence; and (ii) the types of licences and the methods of granting licences.

1. Rationales for awarding licences and principles governing the award of licences

There are two main rationales for requesting communications infrastructure operators to obtain a licence before they start operation. First, some communications infrastructures (e.g., wireless local loop access) require access to scarce resources (e.g., spectrum). In such circumstances, licensing is a tool to allocate the scarce commodity among competitors. Second, licensing can also be used to prevent market failures by imposing a series of conditions on operators. Besides ensuring compliance with certain technical requirements, such conditions generally seek to prevent abuses of market power (e.g., by requiring companies which hold market power to file tariffs and costs information or to guarantee interconnection) or to achieve social (e.g., universal service provisions), environmental or consumer protection requirements.²²

As a matter of good policy, governments should refrain from adopting licensing procedures that may act as barriers to entry (e.g., because there are too heavy) or generate distortions of competition (e.g., because they discriminate against certain categories of operators). Accordingly, when they design licensing procedures, governments should try to comply as much as possible with the following principles:²³

- authorities awarding licences should be independent of actors in the sector. For instance, it is preferable that governments holding shares of one of several operators be not involved in the licensing process;
- procedures should be transparent and non-discriminatory, set against defined timetables, leading to decisions which should be open to appeal;
- fees associated with a licence must be in proportion to the level of effort involved in administering the licensing process, and not constitute a discriminatory levy on expected profits;²⁴
- new entrants should not necessarily have to comply with the same conditions as the incumbent and may instead be subject to a lighter regulatory regime. For instance, since they do not have market power, there is no need to require new entrants to file tariffs and subject them to price control;

²¹ See H. Ungerer, "Ensuring Efficient Access to Bottleneck Network Facilities: The Case of Telecommunications in the European Union", available at <<http://europa.eu.int/en/comm/gg04/dg4home.htm>>.

²² In the broadcasting sector, licences also typically contain requirements regarding the content of the programmes shown (e.g., must-carry obligations). See Garzaniti, *Telecommunications, Broadcasting and the Internet*, Sweet&Maxwell, 2000, at §3-13.

²³ See Ypsilanti and Xavier, *supra* note 14, at 657; Kiessling and Blondeel, *supra* note 5, at 584.

²⁴ As will be seen in the next section, in the case of licensing of spectrum of other valuable resources fees may be set at a level which encourages the efficient resources allocated. *Id.*

- the number of licences should not be limited in any category of infrastructure provision except on the ground of scarcity of resources. Governments may indeed be tempted to limit the number of competitors in order to protect favoured operators; and
- licences should not contain conditions impose unnecessary burdens on operators. For instance, it is reported that the French Government included a provision in operators' licence conditions that at least 5% of the company's investment has to be spent on research and development.²⁵ Such measures have to potential to deter desirable market entry and thus should not be included in the licences.

2. Types of licences and methods of granting licences

In most regulatory regimes, a distinction is generally made between *class* licences and *individual* licences.²⁶ A class licence procedure provides that undertakings complying with certain conditions can start their operations without having to obtain prior approval from the licensing authority. In contrast, an individual licence procedure requires undertakings to obtain an explicit authorisation from the licensing authority before it is allowed to initiate its operations. Class licences will thus usually contain a limited number of "off-the-shelf" conditions which can apply to all operators alike. On the other hand, individual licences are "tailored-made" for each licensee. Licensing authorities will often use the greater discretion they have in the formulation of individual licence conditions to impose more detailed conditions on market players than they would normally impose under a class licence procedure. In general, class licence procedures impose a lighter regulatory burden on operators and are thus more conducive to market entry than individual licensing regimes.

The number of class licences awarded is by definition unlimited and we have seen above that the number of individual licences should only be limited in specific circumstances, such as the need to allocate scarce resources.²⁷ Various methods have traditionally been used to allocate such resources, such as administrative processes,²⁸ lotteries²⁹ or a system of first-come-first-served. In recent years, most experts have considered that the best way to allocate limited resources was through a system of auctions.³⁰ Auctions present several advantages. First, auctions are an objective and transparent way to allocate resources. Second, they are efficiency-enhancing in that they permit to assign the licenses to the firms able to value them the most. Third, they enable the price of the scarce resource to be set directly and objectively by the market and also raise revenues for the government. Finally, the government can design the auction process to address various policy goals, such as the introduction of competition.

3.2 Controlling behaviours on the market

The three main issues which may affect the *management* of communications infrastructure are examined in this section: (i) interconnection; (ii) unbundling of the local loop; and (iii) cross-subsidisation.

1. Interconnection

²⁵ See Kiessling and Blondeel, *supra* note 5, at 585.

²⁶ This paragraph is based on P. Larouche, *Competition Law and Regulation in European Telecommunications*, Hart Publishing, Oxford, 2000, at 34.

²⁷ Generally the methods of allocating scarce resources, see Valeen Afualo and John McMillan, "Actions of Rights to Public Property", text prepared for the New Palgrave Dictionary of Law and Economics (Peter Newman, Ed.), available at <<http://www-irps.ucsd.edu/irps/faculty/auctions.htm>>

²⁸ Under this approach, the allocation of the resource is made by bureaucrats (usually regulators or ministry officials), either by some ad-hoc process or through formally constituted hearings.

²⁹ Lotteries are an assignment of public resources through a random drawing.

³⁰ Generally on auctions, see Preston McAfee and John McMillan, "Auctions and Bidding", 25 *Journal of Economic Literature* 699; John McMillan, "Selling Spectrum Rights", 8 *Journal of Economic Perspectives* 145.

Telecommunications services derive their value from connecting the originator of a message to the recipient.³¹ Because entrants cannot immediately enter at a scale that gives them a large fraction of access customers, initially at least most or all connections must make use of the facilities of the incumbent. Given the entrants' need for interconnection, an incumbent can use two strategies to restrict market entry. One is to charge high prices for completing connections that make use of the entrant's facilities. This will make it impossible for entrants to undercut the incumbent's prices. The other is to provide poor quality interconnection to the new entrants. This will discourage quality-conscious consumers to purchase services from the new entrants. Experience teaches incumbents frequently combine these strategies to retain their stranglehold on the market.

The interconnection problem has been dealt with in a variety of ways by regulatory authorities. A first approach is simply to ignore the problem and require that competitors negotiate interconnection privately. However, this approach will generally create considerable difficulties for entrants since incumbents have no incentive to reach an agreement. They will simply refuse to conclude an agreement or will use their market power to impose prices that are unfavourable to the entrants. As a supplement to private negotiation, one can of course rely on competition rules to force the incumbent to grant interconnection rights (under competition law, the network will generally be considered as an "essential facility" access to which must be given to competitors against reasonable compensation) and to prohibit excessive pricing.³² This was the approach chosen by the New Zealand Government when it decided to liberalise its telecommunications market in the 1980's. As already noted, reliance on competition law led to long and costly litigation and delayed entry of new competitors.³³

As far as long-distance and value-added services are concerned, another approach is to mandate vertical separation of these services from local access. This was the approach followed by the US antitrust authorities in the famous AT&T divestiture case, which eventually led to a settlement requiring AT&T to divest its local service subsidiaries.³⁴ Vertical segmentation has the advantage that it removes the incentives for the firm controlling the local infrastructure to discriminate between access seekers, as well as to engage in cross-subsidisation.³⁵ Another potential advantage

³¹ This paragraph and the next three are based on Roger G. Noll, "Telecommunications Reform in Developing Countries" *AEI-Brookings Joint Center for Regulatory Studies*, Working Paper 99-10, November 1999, p. 47 et seq.

³² See J. Soma et al., "The Essential Facilities Doctrine in the Deregulated Telecommunications Industry", (1998) 13 *Berkeley Technology Law Journal* 565.

³³ Some authors continue to prefer this approach. See, e.g., E. Nowicki, "Competition in the Local Telecommunications Market: Legislate or Litigate?", (1996) 9 *Harvard Journal of Law & Technology* 353 ("(The US) Congress would have wiser to subject local exchange carriers to antitrust laws rather than the Act. Threatened or actual enforcement of the antitrust laws would foster negotiation between local exchange carriers who truly dominate the market and entering carriers who desire interconnection to the local exchange market").

³⁴ One of the core of the DoJ's case was that AT&T was granting competitors interconnection to its local exchange network only on discriminatory terms. After long negotiations, AT&T and the DoJ announced they had entered into a consent decree designed to end the litigation whereby AT&T agreed to divest its 22 BOCs into seven independent local exchange carriers in exchange for being permitted to enter into other lines of business and compete with virtually no restrictions in long-distance services. See *United States v. AT&T Co.*, 552 F. Supp. 131 (D.D.C. 1982), *aff'd sub nom. Maryland v. United States*, 460 U.S. 1001 (1983). There is an abundant academic literature on this case. See, for example, Timothy J. Brennan, "Regulated Firms in Unregulated Markets: Understanding the Divestiture in *US v. AT&T*", (1987) 32 *Antitrust Bulletin* 741; Paul W. Mac Avoy & Kenneth Robinson, "Winning by Losing: The AT&T Settlement and its Impact on Telecommunications", (1983) 1 *Yale Journal on Regulation* 1.

³⁵ See *infra* text accompanying notes 62-63.

of segmentation is that, when local and long-distance network operators have been separated, there is the possibility of having separate local network operators, each holding a monopoly in its region.³⁶ This may contribute to enhance the effectiveness of regulation of local operators by allowing some forms of benchmarking and yardstick competition. On the other hand, vertical segmentation is sometimes criticised on the ground that it prevents economies of scope to be realised between the activities concerned when such economies can not be achieved by means of contractual relations between the firms.³⁷

Finally, the last and perhaps most effective means to deal with the interconnection issue is to formulate rules requiring the incumbent to grant access to its local infrastructure. This approach has been followed in most countries seeking to introduce competition in telecommunications services. For instance, the 1996 Telecommunications Act provides that Incumbent Local Exchange Carriers (ILECs) are required to provide interconnection "at any technically feasible point with the carrier's network".³⁸ Similarly, EC Directive 97/33 on interconnection provides that telecommunications operators holding significant market power (i.e., typically the incumbent) must meet all reasonable requests for access to their network, including access at points other than the network termination offered to the majority of users.³⁹

One of the most complex issues of telecommunications regulation concerns pricing of interconnection services.⁴⁰ Interconnection pricing should be designed to strike the right balance between a number of inter-related objectives: (i) to promote competition between different operators; (ii) to give unbiased choices to new entrants whether to access the incumbent's infrastructure or build their own; and (iii) to preserve the incumbent's incentives to maintain and build its infrastructure.

Several pricing models have been proposed to set the rate of interconnection services, such as the "Long-Run Incremental Cost" (LRIC) model⁴¹ and the "Efficient Component Pricing Rule" (ECPR).⁴² These methods strike the balance between the above objectives quite differently. For instance, one clear advantage of the LRIC methodology is that it promotes competition by new entrants in the downstream market since it does not compensate the incumbent for the profits it might forego in providing access. On the other hand, LRIC might induce inefficient entry.⁴³ If the incumbent makes monopoly profits in the downstream market, a firm with higher costs than the incumbent might still enter the market if it accepts lower profits than the incumbent. By contrast, the ECPR ensures that only efficient entry can take place. LRIC is also criticised on the ground that, since it is based on the incremental cost of providing access, it might fail to ensure that the incumbent is able to cover its whole costs when average costs are higher than marginal costs, as it is

³⁶ See Amtrong et al., *Regulatory Reform: Economic Analysis and the British Experience*, MIT Press, 1994, p. 207.

³⁷ Id. supra note 35, at 206.

³⁸ 47 U.S.C. § 251(c)(2)(B). In practice, this means that incumbents must interconnect with all carriers upon request, at the locations they specify, while other carriers may interconnect with each other indirectly, i.e. by each carrier connecting to the incumbent.

³⁹ Directive 97/33 on interconnection in telecommunications with regard to ensuring universal service and interoperability through application of the principles of Open Network Provision (ONP), 1997 O.J., L 199/32

⁴⁰ Generally, on this issue, see J.J. Laffont and J. Tirole, "Access Pricing and Competition", (1994) 38 *European Economic Review* 1673; J. Michie, "Competition Aspects of Pricing Access to Networks", (1998) 22 *Telecommunications Policy* 467.

⁴¹ The LRIC model aims at determining access prices by evaluating the costs which would be incurred in providing such access by an incumbent using the current most efficient technology to do so. The costs to be considered are those which are causally related to the provision of access.

⁴² The ECPR model forces the incumbent to charge an access price which is the incremental cost of providing access plus the opportunity cost of (or profit forgone in) providing access. Generally on the ECPR, see W. Baumol and G. Sidak, *Toward Competition in Local Telephony*, MIT Press and AEI Press, 1994, 105-07; W. Baumol and G. Sidak, "The Pricing of Input Sold to Competitors", (1994) 11 *Yale Journal of Regulation* 171.

⁴³ For a very detailed analysis of the shortcomings of LRIC, see G. Sidak and D. Spulber, *Deregulatory Takings and the Regulatory Contract: The Competitive Transformation of Competitive Industries in the United States*, Cambridge University Press, 1997, at 403-427.

the case in industries exhibiting increasing return on scale. This may allow new entrants to free ride on the incumbent's facilities and, thus, discourages both incumbents and new entrants to invest.⁴⁴

2. Unbundling of the local loop

The term "local loop unbundling" (hereafter "LLU") refers to a range of solutions designed to give competitive (tele)communications service providers open access to the incumbent's local loop infrastructure, i.e. to the wires linking the network termination points at customer's premises and the local switch.⁴⁵ The interconnection regimes described in the preceding section oblige incumbents to terminate calls forwarded by new entrants. However, new entrants are forced to lease the use of the incumbent's exchange equipment (something they might not necessarily need) and are unable, without the introduction of unbundling, to attach their own broadband ADSL equipment (something they might be willing to do).

Originally conceived as a way to stimulate competition in public switched telephony, LLU is now seen by many as a key instrument to widen consumer choices in the supply of high bandwidth services.⁴⁶ As pointed out by Doyle, it could be argued that in a context of fast growing demand for higher bandwidth services, ULL is unnecessary. Demand for such services should stimulate investments in alternative infrastructures, such as optical fibre, cable modems and wireless local loop access.⁴⁷ These alternative infrastructures would then compete against the ADSL services offered by the incumbents, thereby putting pressure on the prices of broadband services and stimulating innovation. However, most observers do not expect ubiquitous service from alternative providers for several years. In the meantime, incumbents will remain dominant in the provision of access for higher bandwidth services. In the present context, LLU is thus necessary to increase competition for the provision of such services and accelerate the speed with which high bandwidth services can be introduced,⁴⁸ in particular for smaller business and residential customers.⁴⁹ This is for this reason that an increasingly large number of States, including the United States and most European countries, have adopted regulatory measures compelling incumbents to unbundle their local loops.⁵⁰

Two key issues with respect to unbundling are (i) which elements of the network should be made available to competitors and (ii) the price to be charged for access to such elements.

As far as the first issue is concerned, it is generally recognised that while essential facilities should be made available to competitors, there should be no obligations to share non-essential facilities with rivals.⁵¹ It seems, however, that some regulators have taken a different view on this matter. In the United States, for instance, the FCC has declined to rely on an essential facilities standard to determine which network elements should be made available to competitors.⁵² Instead, it appears to

⁴⁴ Id. at 410.

⁴⁵ See Analysys, "Unbundling the Access Network: Opening the Door to Local Competition" (hereafter, "Unbundling the Access Network"), document available at <http://www.regulate.org/Resources/resources/trend2_0.htm>.

⁴⁶ See C. Doyle, "Local Loop Unbundling and Regulatory Risk", (2000) 1 *Journal of Network Industries* 33, 35.

⁴⁷ Id. at 48.

⁴⁸ See "Unbundling the Access Network", supra note 44.

⁴⁹ For these customers, deployment of optical fibre is not (yet) an economically-viable alternative.

⁵⁰ See E-O Rühle, "The Regulation of Unbundled Network Elements Throughout Europe and the United States: Implications for the Development of Competition in Local Markets", Paper for the ITS 2000 Conference "The Bridge to Globalization in the Information Society", Buenos Aires, 2-5 July 2000, available at <http://www.its2000.org.ar/conference/f_papers.html>.

⁵¹ See D. Ypsilanti and P. Xavier, supra note 14, 653.

⁵² Under the 1996 Telecommunications Act, network elements are to be made available to competitors if (i) in case they are considered proprietary to the incumbent, they are necessary inputs for other firms to compete or (ii) when they are not proprietary, competitors would be impaired if they could not avail themselves to such elements. 47 U.S.C. § 251(d)(2). The FCC is entrusted with defining the elements which meet this "necessary and impair" standard. In its so-called "First Order", the FCC required that the following elements be made available to competitors: (1) local

have interpreted its mandate as determining whether the availability of elements from the incumbent's network can enhance the business prospects of the firms that could make use of such elements.⁵³ On this basis, the FCC decided to maintain in its UNE list facilities elements, such as loops in dense urban areas, despite the fact that competitive carriers are deploying alternative facilities.⁵⁴

The second key issue is the price at which ULL access will be given. If access prices are too low, making cost recovery difficult, they could discourage incumbents to make investments to develop, or even maintain, their network. In addition, by allowing new entrants to free ride on the incumbent's network, they would also discourage investment in alternative infrastructures.⁵⁵ As in the case of interconnection, ULL pricing strategies should thus strike a balance between several policy objectives, i.e. promoting competition (in voice telephony and in broadband services), giving unbiased choices to new entrants whether to rely on the incumbent's facilities or build their networks, and preserving the incumbent's incentives to maintain and build its infrastructure. Here again, the way this balance is struck will depend on the pricing methodology (LRIC, ECPR or other) pursued.⁵⁶

3. Cross-subsidisation

In its notice on the application of the competition rules to the telecommunications sector,⁵⁷ the European Commission defines the concept of cross-subsidies as the technique by which:

"an undertaking allocates all or parts of the costs of its activity in one geographical or product market to its activity in another geographical or product market".⁵⁸

Pursuant to this definition, cross-subsidies arise when an undertaking fails to allocate costs properly between two or several different activities. Other definitions do not place the emphasis on the allocation of costs but on transfer of revenues between activities: cross-subsidies would arise when revenues generated in one activity are used to subsidise losses incurred in another activity of the same company.⁵⁹ In both cases (misallocation of costs and transfer of revenues), the economic effect is the same: while some products or services will be over-priced, others will be sold at prices that do not cover costs.⁶⁰

loop; (2) the network interface device; (3) switching; (4) interoffice transport; (5) signalling; (6) operations support systems; and (7) operator services and directory assistance. Upon appeal by certain State utility commissions and the incumbent carriers, the US Supreme Court ruled that the FCC provide a more adequate justification for its action, suggesting that the "essential facilities" doctrine standard might be the correct basis for satisfying the "necessary and impair" requirements of the 1996 Act. *AT&T Corp. et al. v. Iowa Utils. Bd. et al.*, 119 S. Ct. 721, 752 (1999). In response to the Court, the FCC released a Third Report and Order which removed the last item and the switching for customers with four or more lines in certain high density areas. On the other hand, the new order requires greater unbundling of the local loop. See T. Tardiff, "New Technologies and Convergence of Markets: Implications for Telecommunications Regulation", (2000) 1 *Journal of Network Industries* 447, 452-53.

⁵³ Id.

⁵⁴ Id. See also Doyle, *supra* note 45, at 54 ("There appears to be no reason to support mandated ULL in densely populated urban areas, as competition among infrastructures is emerging").

⁵⁵ This is the line of argument defended by several authors, usually acting as advisors to the incumbent local exchange carriers, in the US context. Specifically, these authors criticise the "Total Element Long-Run Incremental Cost" (TELRIC) pricing methodology chosen by the FCC as the basis to calculate the prices of unbundled network elements arguing it confers implicit subsidies to those purchasing elements, with resulting negative consequences on efficiency, competition, and innovation. Instead, they propose a pricing method based on the ECPR methodology explained above. See, generally, G. Sidak and D. Spulber, "The Tragedy of the Telecommons: Government Pricing of Unbundled Network Elements Under the Telecommunications Act of 1996", (1997) 97 *Columbia Law Review* 1081; J. Hausman and G. Sidak, "A Consumer-Welfare Approach to the Mandatory Unbundling of Telecommunications Networks", (1999) 109 *Yale Law Journal* 417.

⁵⁶ Doyle, *supra* note 45, at 48-50.

⁵⁷ O.J. 1991, C 233.

⁵⁸ Section 102 of the notice.

⁵⁹ See European Commission, Green Paper on the Development of the Common Market for Telecommunications Services, COM(87)290, p. 77.

⁶⁰ See M. Bronckers, "Cross-Subsidization in EEC Competition Law" in J. Stuyck and A. Vossesstein, *State Entrepreneurship, National Monopolies and European Community Law*, Kluwer, European Law Series, 1993, p. 103.

Cross-subsidisation can distort competition in communications infrastructure when it is used by a firm which occupies a monopolistic position in one market to extend its market power in another market.⁶¹ For instance, in a telecommunications market where local telephony has not yet been liberalised, a vertically integrated telecommunications operator could be tempted to use the revenues generated by local service (where it holds a statutory monopoly) to expand its activities in the long-distance market (where it faces competition from other carriers). Such a concern will usually remain after liberalisation as long as the vertically integrated incumbent retains market power in the local segment.

Several forms of regulatory intervention can be used to prevent anti-competitive cross-subsidisation practices.⁶² Here, a distinction can be made between structural and behavioural measures.

As far as the first category is concerned, the most drastic way to prevent cross-subsidisation is to break down vertically- or horizontally-integrated monopoly providers into several distinct companies with separate ownership. This strategy of "divestiture" was, for instance, pursued by the US antitrust authorities in the AT&T break-up case described above.⁶³ Besides preventing discriminatory interconnection,⁶⁴ one of the objectives of the break-up decision was to prevent AT&T to use revenues generated by its monopoly on local exchange services to cross-subsidise inter-city services on which it had to face competition. A less radical approach is to require that monopoly and competitive activities be provided by distinct subsidiaries. In the European Union, this approach was, for instance, followed in Directive 1999/64 which requires that telecommunications networks and cable TV owned by a single operator be managed in separate legal entities.⁶⁵

Cross-subsidisation can also be prevented through a variety of behavioural measures. One such measure is to require accounting separation between "monopolistic" and "competitive" activities. This approach is, for instance, followed in the EC Interconnection Directive which provides that:

"Member States shall require organisations providing public telecommunications networks and/or publicly available telecommunications services which have special or exclusive rights for the provision of services in other sectors in the same or another Member State to keep separate accounts for the telecommunications activities, to the extent that would be required if the telecommunications activities in question were carried out by legally independent companies (...)"

In most regulatory regimes, accounting separation requirements are generally accompanied by strict cost allocation requirements.⁶⁶ The objective of these requirements is to ensure that costs pertaining to competitive services are fully or proportionately allocated to new services.

⁶¹ There is a large body of academic literature on cross-subsidies. See, e.g., G. Faulhaber, "Cross-Subsidization: Pricing in Public Enterprises", (1975) 65 *The American Economic Review*, p. 966; E. Bailey and A. Friedlaender, "Market Structure and Multiproduct Industries", (1982) 20 *Journal of Economic Perspectives*, p. 1024; N. Curien, "The Theory and Measure of Cross-Subsidies: An Application to the Telecommunications Industry", (1991) 9 *International Journal of Industrial Organization*, p. 73; D. Heald, "Public Policy Towards Cross-Subsidy", (1997) 68 *Annals of Public and Cooperative Economics*, p. 591; T. Brennan, "Cross-Subsidization and Cost Misallocation by Regulated Monopolists", (1990) 2 *Journal of Regulatory Economics*, p. 37.

⁶² Note also that, when the monopolistic activities of a vertically or horizontally-integrated company are subject to price control, relying on price caps, instead of rate-of-return regulation, eliminates incentives to finance low prices for competitive services with higher prices for less competitive services. J. Hausman and T. Tardiff, "Efficient Local Exchange Competition", (1995) 40 *Antitrust Bulletin*, p. 529.

⁶³ See supra text accompanying notes 33.

⁶⁴ Id.

⁶⁵ Commission Directive 1999/64 of 23 June 1999 amending Directive 90/388 in order to ensure that telecommunications networks and cable TV operators owned by a single operator are separate legal entities, O.J. 1999, L 175/39. For a discussion of the draft Directive, see A. Bartosch, "EC Telecommunications Law: The New Draft Directive on the Legal Separation of Networks", (1998) *European Competition Law Review*, p. 514.

⁶⁶ In EC telecommunications law, see Article 13.3 of Directive 95/62 of 13 December 1995 on the application of open network provision (ONP) to voice telephony, 1995 O.J., L 321/6 and the Commission Recommendation of 8 April 1998 on interconnection in a liberalised telecommunications market, Part 2 – Accounting separation and accounting cost, 1998 O.J., L 141/6.

Finally, it should be noted that, in most jurisdictions, cross-subsidisation of competitive services with monopoly activities is recognised as an abuse of a dominant position.⁶⁷ Absent *ex ante* regulatory intervention or when such intervention has proved insufficient, cross-subsidisation practices can be eliminated through the application of competition rules.⁶⁸

3.3 Impact of convergence

The notion of convergence is commonly used to refer to the progressive disappearance of the boundaries between technologies, services and markets traditionally regarded as distinct. This process is essentially driven by digitalisation and other forms of technological progress. For present purpose, it should be noted that these developments have important repercussion for the design of regulatory policies. Following a preliminary review of the technological and commercial background to the process of convergence (Section A), the remainder of this paper will be devoted to an examination of some of the regulatory issues thereby raised. Those remarks will be organised as follows: firstly, regulatory issues related to market assess will be examined (Section B), secondly, issues more relevant to the control of market behaviour will be briefly surveyed (Section C).

A. What is convergence?

Convergence takes place at level of network elements. Networks previously dedicated to the provision of a given service can now equally convey other services. Thus cable networks become potential alternatives to telecommunications networks for the delivery of telecommunications services. Conversely, telecommunications networks may technically be used for the transmission of audio-visual content. Moreover, the performance of mobile communications has also greatly improved and is leading to a fixed/mobile convergence. Indeed, the anticipated launch of UMTS promises to support a large number of broadband applications.⁶⁹ Finally, network convergence could in the future extend to electricity networks as it is being envisaged that electricity power lines could be used to transmit telecommunications signals.⁷⁰ This possibility rest on recent experiences with so-called "power line technology"⁷¹ and an increasingly large number of companies such as VEBA,⁷² ENEL,⁷³ Electricom,⁷⁴ or Enikia⁷⁵ are trying to exploit this new window of opportunities.⁷⁶

⁶⁷ For discussions of the EC law context, see L. Hancher and J.L. Buendia Sierra, "Cross-Subsidization in EC Law", (1998) 35 *Common Market Law Review*, p. 901; G. Abbamonte, "Cross-Subsidisation and Community Competition Rules: Efficient Pricing Versus Equity?", (1998) 23 *European Law Review*, p. 414.

⁶⁸ See D. Geradin, "The Opening of State Monopolies to Competition: Main Issues of the Liberalization Process" in D. Geradin, Ed., supra note 11, 188-94.

⁶⁹ See further F. Pieper & P. Opdemom "Fixed-Mobile Convergence and Regulation - The European / German example", Paper presented at the ITS Conference - 2000, available at <http://www.its2000.org.ar/conference/f_papers.html>.

⁷⁰ See C. Levesque, "Pipes and Wires: A Hot Market for Telecoms Rights-of-Way", Vol. 138, *Public Utilities Fortnightly*, 1 March 2000, p. 56. For the time being, companies possessing transmission systems install fibre-optic cables alongside their electricity pylons and thereby offer long-distance telecommunications services. Such companies are thus simply making use of their existing rights of way. This strategy has been pursued by Energis, originally a wholly-owned subsidiary of the UK National Grid Company. Energis' use of the National Grid's transmission infrastructure enabled it to roll-out a fibre optic network more quickly and a lower cost that would have been possible using conventional underground cable-laying procedures.

⁷¹ A breakthrough in this field took place in October 1997 when UK electricity company Norweb, in collaboration with Canadian telecommunications manufacturer Nortel, announced the development of a system for sending data along power lines without excessive distortion by interference. The two companies subsequently announced the formation of a joint venture Nor.Web to market this technology. This joint venture was, however, dismantled in September 1999. See "Net over Grid Powers Down", document available at <<http://www.zdnet.co.uk/news/1999/36/ns-9906.html>> .

⁷² See <http://www.veba-archives.com/index_en.html>. VEBA has now merged with VIAG to create E.On.

⁷³ See "Enel Outlines \$208 m Internet and Technology Service Strategy", *Financial Times*, 22 December 1999.

⁷⁴ See <<http://www.electricom.co.uk/>>.

⁷⁵ See <<http://www.Enikia.com>>.

⁷⁶ A Power Line Telecommunications Forum (known as "PLC Forum") was established on 23-24 March 2000 in Interlaken, Switzerland, with the aim of uniting and representing the interests of players engaged in that technology. See <<http://www.plcforum.org>>.

Nevertheless, in spite of the fact that growing network substitutability can be anticipated, it is still premature to argue - as some do - that distinctions based on transmission networks have already become obsolete.⁷⁷ Significant investments are still required. The cable infrastructure, for instance, is often penalised by its original conception as a unidirectional network making it unsuited for interactive application such as voice telephony or the Internet. The traditional telecommunications infrastructure, on the other hand, is handicapped by the low capacity of its local loop. These are frequently unsuited for the delivery of broadband services.⁷⁸ The development of new high-speed, digital, interactive, multimedia services will require increasing broadband. The development of network infrastructures able to carry such high bandwidth multimedia applications will thus be crucial in the coming years.⁷⁹

Whilst this section of the paper is limited to addressing some of the issues raised by growing network substitution it should be emphasised for the sake of completeness that convergence extends beyond the purely technological level. The advent of *network* convergence is most visibly matched by the emergence of hybrid services based on the cross-fertilisation between previously distinct activities. Thus sophisticated pay-TV services are being put on the market and still more innovative types of services, which today remain at an experimental stage will follow.⁸⁰ Such *service* convergence points to an underlying degree of *market* convergence.

Thus the dismantling of technological entry barriers provides infrastructure owners with an opportunity to maximise the value of their network by exploiting the economies of scope that a diversification of their business activities would produce. This leads to different degrees of *market* convergence. In some instances, such convergence can be fully fledged with the result that previously distinct activities are coalescing to such an extent that old distinctions have become an anachronism. This trend can arguably be observed in the process of integration taking place between the telecommunications, audio-visual and information technology sectors.⁸¹ These sectors are progressively being united into a ubiquitous communications industry.

However, convergence does not necessarily have such dramatic effects but can instead consist in a looser form of integration. Thus whilst many electricity utilities have invested in the telecommunications sector, it cannot be said that the electricity and telecommunications sector have lost their distinct features. This latter development is better described as the emergence of multi-utilities.⁸² It is important to bear such distinctions in mind when discussing the impact of convergence on the regulatory front. Indeed, different degrees of convergence may call for different regulatory responses.

B. Impact of convergence on regulatory issues: controlling access to the market

As a preliminary matter, the impact of network convergence on regulatory competence and licensing policy should be examined. In addition, the merits of so-called lines of business restrictions will be reviewed. Finally, the difficulties raised by so-called dual ownership structures whereby alternative networks are controlled by the same undertaking will be outlined.

⁷⁷ See K.Werbach, *Digital Tornado: The Internet and Telecommunications Policy*, Office of Plans and Policy, Working Paper No. 29, March 1997, Federal Communications Commission, Washington DC.

⁷⁸ See further S. Benerofe et J.D. Kissane "The Technology Wars of Digital Convergence" available at <<http://www.harvnet.harvard.edu/online>>.

⁷⁹ See A. McAdams et al., "The Evolution of US Telecommunications Infrastructure", (2000) 2, *Info*, 107, at 108

⁸⁰ Such services include interactive video, video-on-demand, ultra-high-speed data, high definition/digital TV, digital games, tele-medicine, video-conferencing, targeted advertising, etc. See further KPMG, *Public Policy Issues arising from Telecommunications and Audiovisual Convergence*, Report presented to the European Commission, 1996.

⁸¹ See on this issue European Commission, *Green Paper on the convergence of the telecommunications, media and information technology sectors, and the implications for regulation - Towards an information society approach*, COM(97) 623. See also European Commission, *Summaries of the results of the public consultation on the Green Paper - Areas for further reflections*, SEC (98) 1284

⁸² See D. Geradin, "Regulatory Issues raised by Network Convergence - The Case of Multi-Utilities", *Journal of Network Industries*, forthcoming 2001.

1. The problems of classification and the risk of regulatory forum shopping

To the extent that convergence leads to the emergence of hybrid services this raises the issue as how to classify these for the purpose of ascertaining the regulatory framework applicable to their market access. This issue is far from being satisfactorily resolved. The main difficulties arise principally as to the distinction between audio-visual and telecommunications services. Traditionally, one of the criteria that have been employed rested upon the delivery infrastructure used for transmission.⁸³ The continued reliance of such criteria in a context of growing network neutrality is no longer tenable. Turf wars between regulatory bodies inevitably ensue, providing, in turn, a fertile soil for regulatory forum shopping strategies.⁸⁴

Accordingly, network convergence would require the adoption of new criteria to replace those that have lost their usefulness in delineating between the regulatory framework respectively applicable to broadcasting and telecommunications - provided of course that a two-pronged regulatory structure is retained. This in turn raises the question as to whether some form of regulatory convergence would not be desirable.

It should be noted however, that if arguments in favour of regulatory convergence can be made there is also a strong case for regulatory relaxation. This is true in particular as far as the licensing of networks is concerned. Indeed, to the extent that licensing procedures are employed to control market power via individually imposed condition on market participants, the merits of this approach may have to be re-examined. The implementation of a more light-handed approach may be advocated if as a result of network convergence new substitutes become available with a resulting loss in market power.

In this context, it should further be emphasised that any licensing mechanism should be technologically neutral. Convergent markets are facing uncertain outcomes. A certain amount of experimentation will need to take place as to which technology and infrastructure is more appropriate for which service.⁸⁵ It is important that the outcome of this process is not arbitrarily distorted by regulatory asymmetry whereby certain network operators are privileged in comparison to others. Network operators should on the contrary be seen as competing providers of transmission infrastructure for multiple and diverse forms of content. Winning technologies should arguably be picked by the markets and not by *ad hoc* regulatory practices.

Accordingly, the objective of technological neutral regulation lends additional support to a light-handed licensing regime based to all possible extent on general (class) rather than individual licences. Indeed, the tailor-made nature of individual licences inevitably increases the potential for imposing different conditions on competing providers thereby distorting the investment decisions in technology.⁸⁶

2. Lines of business restriction: a chilling effect on convergence?

Lines of business restrictions prevent operators active in one industry from entering into other market segments. Such restrictions thus tend to severely inhibit business diversification. The prohibition formerly imposed upon British Telecommunications (BT) preventing it from providing

⁸³ For further analysis see P. Vittet-Phillipe "New Digital Services: Options for Leveraging Digital Convergence in Europe – Contribution to a Reflection in Progress" (1998) 14 *Computer Law and Security Report*, p.393.

⁸⁴ See Germany where an acrimonious dispute between Bund and Landers took place leading in turn to the adoption of legislation considered by many as unsatisfactory in nature. See Informations – und Kommunikationsdienste-Gesetz – IuKDG of 22 July 1997 and Mediendienste – Staatsvertrag of 1 August 1997. For comments see R. Cornelius von Heyl "Teledienste und Mediendienste nach Teledienstegesetz und Mediendienste – Staatsvertrag", (1998) 2 ZUM, p.120.

⁸⁵ See D. Ypsilanti and P. Xavier, *supra* note 14, at 646.

⁸⁶ The merits of greater reliance on general as opposed to individual licenses in a context of convergence has been recognised by the European Commission, *Towards a new framework for electronic communications infrastructure and associated services - The 1999 Communications Review*, COM (99) 539. See further Proposal for a European Parliament and Council Directive on the authorisation of electronic communications network and services, COM (2000) 386.

broadcasting services is frequently cited as an illustration.⁸⁷ Similar lines of business restrictions can be found in cross-ownership restrictions between the telecommunications and broadcasting sectors.⁸⁸ Further illustrations are provided by the restrictions imposed in the United States on certain electricity utilities from entering into the telecommunications markets.⁸⁹

Different opinions have been expressed on the merits of such line of business restrictions. It has sometimes been argued that such restrictions are necessary to preserve or enable competition to mature on a given market. An argument can be made for protecting cable operators from the entry of telecommunications operators in order to protect their fragile investment. It is on the other hand more difficult to justify excluding electricity utilities from entry into the telecommunications sector for fears of undue leverage of monopoly power. It is unlikely that a utility would actually succeed in such a conduct as telecommunications operators generally have sufficient resources to resist such aggressive entry.⁹⁰ The outcome of such behaviour would thus be a fall of revenues for both electricity utilities and telecommunications operators.

Moreover, it must be recognised that lines of business restrictions do to some extent restrain technological innovation.⁹¹ This takes place at two levels. Firstly, network operators are discouraged from increasing the capacity of their network since they cannot benefit from the economies of scale and scope that would result from the provision of multiple services over their infrastructure. Arguably, this fails to take into account that lines of business restriction can be limited in time. Networks can be upgraded in the meantime in order to be capable to be put to a multifunctional use once the restrictions are lifted. The likelihood of such investments being made in anticipation is in turn dependant upon the credibility attached to the date announced for the removal of the lines of business restrictions. Inevitably, fears of regulatory capture could be voiced in this respect.⁹² Secondly, by artificially shielding from competition certain privileged operators lines of business restrictions run the risk of promoting and protecting inefficiency. Again, the credible threat that these restrictions will be lifted in a not too distant future may go some way towards curbing any tendency towards slackness.

Nevertheless, in a pre-converged environment there is an argument to be made that lines of business restrictions send the wrong signals to the market given that the sheer size of the required investment renders crucial the possibility to exploit economies of scope. Moreover, it is important to recognise that the concern underpinning such lines of business restrictions is often the fear that otherwise entry will be financed by an aggressive strategy of cross-subsidies. The question may thus be asked whether existing instruments in the shape of either antitrust rules or sector-specific obligations are not already sufficient to adequately respond to these concerns. In turn, as will be seen later, the anti-competitive worries attached to cross-subsidies are all too often exaggerated.

⁸⁷ See N. Garnham et G. Mulgan "Broadband and the barriers to convergence in the European Community" (1991) *Telecommunications Policy*, p.182. However, in a 1998 policy document "Broadband Britain", the Government indicated its decision to progressively relax the line of business restrictions imposed on public telecommunications operators. See Department of Trade and Industry, "Broadband Britain: A Fresh Look at the Broadcast Entertainment Restrictions", April 1998, available at <<http://www.dti.gov.uk/cii/c20/index.html>>. Pursuant to this new approach, national public telecommunications operators were permitted to both convey and provide broadcast entertainment over their networks in areas of the country not yet covered by cable operator franchises, with a commitment to allow national PTOs and others to convey and provide broadcast entertainment throughout the whole territory from 1 January 2001.

⁸⁸ See on this issue generally OECD "Cross Ownership and Convergence Policy issues", available at <<http://www.oecd.org/dsti/sti/it/cm/prod/tisp98-3.htm>>.

⁸⁹ See L. Spiwak "Utility Entry into Telecommunications: Exactly how serious are we?", Phoenix Center Policy Paper No1, July 1998, available at <<http://www.phoenix-center.org/wps.html>>.

⁹⁰ Id. at 54

⁹¹ See N. Garnham et G. Mulgan supra note 87, at 187.

⁹² On the theory of regulatory capture, see see Georges Stigler, "The Theory of Economic Regulation", 2 (1971) *Bell Journal of Economic Regulation* 3; Richard Posner, "Theories of Economic Regulation", 5 (1974) *Bell Journal of Economic Regulation* 335; Sam Peltzman, "Toward a More General Theory of Regulation", 19 (1976) *Journal of Law and Economics* 211.

Entry, however, becomes an issue when associated with the acquisition of market power. That would be the case if a majority of potentially competing networks fell into the hands of a single operator. Thus, whereas entry into the cable TV market by operators of telecommunications networks fosters competition, acquisition of cable TV networks by the same operators raises concerns in terms of abuse of market power. Whilst dual ownership is problematic in a post convergence environment, it is also particularly awkward in a pre convergence setting.

3. Joint ownership: another chilling effect on convergence?

Joint ownership refers to the situation where an operator controls two potentially competing facilities. Such a situation has occurred in Europe in relation to ownership of the cable network. It has thus been reported that on the eve of full liberalisation of the EU telecommunications market in 1998, nearly 60% of cable customers were served by a cable operator wholly or partly owned by the local telecommunications incumbent.⁹³ In Germany, for instance Deutsche Telecom still controls a substantial proportion of both the telecommunications infrastructure and the cable networks.⁹⁴ Consequently, a sole operator controls two potentially competing access points to the end user.

Whilst it manifestly facilitates the imposition of unfair conditions on network access, joint ownership, more importantly for present purpose, also delays the upgrading of networks and the infrastructure competition that could ultimately result there from. Indeed, the joint owner has limited incentives to engage in the bi-directional upgrading of the cable network since this would simply translate into a risk of shifting away customers currently attached to its telecommunications network.⁹⁵ This situation has led, for example, the European Commission to conclude that sole ownership of the cable and telecommunication network amounts to an important factor impeding the advent of the multimedia age.⁹⁶ In addition, it prevents the emergence of alternative networks that could potentially play an important role in alleviating the traditional bottleneck existing at the local loop level.

The most suitable remedy in such a situation is likely to be one of divestiture as this would eliminate the underlying conflict of interest that currently leads to investments being postponed. At the European level, whilst such a remedy has found much favour with the European Commission, it has not so far been imposed by way of regulation for lack of a proper legal basis.⁹⁷

C. Impact of convergence on regulatory issues: Controlling behaviours on the market

The following issues will briefly be reviewed in this section. Firstly, the impact of convergence on the access and interconnection regimes will be examined. Secondly, the question as to the appropriateness in a context of network convergence of the unbundling of the local loop will be addressed. Thirdly, some comments will be made on the issue of cross subsidies and cost allocation. Whilst certain bottlenecks are arguably eliminated, convergence also generates a risk that new bottleneck are being created. This aspect will be considered in the final part of this section.

⁹³ See H. Ungerer "Access Issues under EU Regulation and Anti-Trust Law - The Case of Telecommunications and Internet Markets", *International Journal of Communications Law and Policy*, Issue 5, Summer 2000, at p15

⁹⁴ It should be noted, however, that Deutsche Telekom has begun to spin off its cable network. Pressure in this respect is also partly mounting as a result of debts accumulated by investment in third generation mobile phones. Certain hurdles to a complete sell-off remain. See further "Deutsche Telekom faces hurdles in cable sell-off", *Total Telecom*, 02 February 2001, available at: <http://www.totaltele.com/view.asp?articleID=36443&Pub=TT&categoryid=628&kw=deutsche+telekom+cable+>>.

⁹⁵ See Commission Communication concerning the review under the competition rules of the joint provision of telecommunications and cable TV networks by a single operator and the abolition of restrictions on the provision of cable TV capacity over telecommunications networks, "Cable review", O.J. (1998) C 71/4. at para. 31.

⁹⁶ Id. at para. 36.

⁹⁷ The European Commission has so far only imposed a requirement that separate legal identities are in charge of the networks under joint ownership. See Commission Directive 1999/64/EC, supra note 64. For an analysis of the existence of a proper legal basis to carry out divestiture see Coudert Brothers, *Study on the Scope of the Legal Instruments Under EC Competition Law Available to the European Commission to Implement the Results of the Ongoing Review of Certain Situations in the Telecommunications and Cable Sectors*, Report to the European Commission, June 1997, p. 101.

1. Interconnection: A need for extension or relaxation of the regulatory regime?

To the extent that open access obligations are imposed by regulation on certain network operators the question inevitably arises as to whether such requirements should not also be extended to other networks. Indeed, if such rules are applied to certain networks but not to others this could potentially distort both competition and investments.⁹⁸ Such an approach entails a risk of excessive regulation. Arguably, the rationale for open access obligations is often eroded since convergence widens the availability of alternative infrastructure thus in turn diluting previously held positions of market power. Technologically neutral regulation should rather be promoted via regulatory relaxation rather than by extending the ambit of open access provisions.

Further, the question should be addressed as to whether regulatory relaxation should extend to interconnection regimes. The interconnection problem is to some extent independent of the number of access points to the end user. The end-user will in all likelihood adhere to a unique network and a service provider will be compelled to interconnect with this network.⁹⁹ This is not to say, however, that network convergence will have no impact whatsoever on this issue. The availability of new alternatives may reduce the number of customers of the incumbent with the result that the number of calls to be terminated on its network will decrease. On the other hand the number of calls that the former incumbent has to terminate on the network of competing operators could increase. Consequently, the incentives to refuse or grant interconnection only on unfavourable terms may diminish in parallel to a reduction of the incumbent's bargaining power. It should be stressed, however, that such a scenario is heavily dependant on the successful introduction of competition at the level of the local loop where the incumbent still possesses near monopolistic market shares.

Yet in a situation of fully-fledged network convergence - which it must be emphasised is still largely hypothetical - four or five networks could be in competition with each other and due to network externalities none of them would benefit from refusing to interconnect.¹⁰⁰ Each would be under a strong incentive to maintain or develop the value of its network and thus to interconnect in order to provide its customers with universal connectivity. Interconnection could be left to commercial negotiations between the parties. Such an interconnection regime would be similar to the interconnection arrangements currently in place between Internet backbone providers that - in the absence of industry specific regulation - are supported by commercial negotiations alone.¹⁰¹

In such a context much emphasis will have to be placed on preventing any network to acquire dominance. Indeed, a large network loses the incentive to co-operate and might be tempted to win over customers of competing network providers by refusing to interconnect or granting such interconnection only on less favourable terms. This would encourage those customers to switch network providers in order to recapture full connectivity to the extensive client base of the large operator. Conversely, the temptation of the latter's customer to migrate could be slight since their loss of connectivity is both limited and likely to remain temporary. A sufficiently large network

⁹⁸ See also D. Ypsilanti and P. Xavier, *supra* note 14, at 653

⁹⁹ See further D. Encaoua and L. Flochet "Droit des télécommunications : entre déréglementation et régulation. La tarification : du monopole à la concurrence régulée" (1997) *Actualité Juridique Droit Administratif*, p. 263.

¹⁰⁰ A network externality is said to exist for a service if users of the service benefit when more people use it. Network externalities are present in the area of telecommunications since the value of a network increases, for each user, with the number of network subscribers. See Mark Amstrong, "Competition in Telecommunications", 13 (1997) *Oxford Review of Economic Policy* 64-65. As a result, for a given total number of subscribers, the value of a single network is much greater than the total value of several smaller unconnected networks. For good discussion of the concept of "network externalities" see Nicholas Economides, "The Economics of Networks", 16 (1996) *International Journal of Industrial Organization*, p. 673; Michael L. Katz & Carl Shapiro, "Network Externalities, Competition, and Compatibility", 75 (1985) *American Economic Review* 424. A large list of published articles on network externalities can be found on the following web-site: <<http://raven.stern.nyu.edu/networks/bibiof.html>>.

¹⁰¹ See further Michael Kende "The Digital Handshake: Connecting Internet Backbones" Office of Plans and Policy - Working Paper No 32, September 2000, Federal Communications Commission, Washington DC.

provider could thus be tempted to engage into such a strategy in order to try to tip the market to its advantage.¹⁰²

The expansion of a network to the point where such risk of tipping would exist could arise in either of two ways: by organic growth or through consolidation in the industry. Whilst the precise moment at which a risk of tipping exist is difficult to determine, stringent antitrust scrutiny via merger control procedures should help to forestall the hegemony of a given network operator. In the event, however, that *ex ante* control proves insufficient the adoption of sector-specific regulation would again become necessary in order to prevent abuses of market power.

2. Unbundling of the local loop: Does it remain appropriate in a converged environment?

The local access remains one of the least competitive market segments. As has been explained above, local loop unbundling essentially pursues a two-pronged objective: developing competition for local access and speeding up the deployment of bandwidth for the introduction of broadband services.¹⁰³ The justification for imposing local loop unbundling as an instrument to achieve these objectives rest on the lack - for the time being - of alternative networks. Once, however, that such alternative networks exist, some of the justification to maintain unbundling requirements should be re-examined.

Moreover, there is a risk that unbundling requirements themselves create disincentives for the deployment of alternative infrastructures. Indeed, unbundling requirements do not only reduce the incentives of the incumbent to invest in its infrastructure but also may also diminish the potential rewards that alternative infrastructure providers could reap from investing in upgrading their transmission technology. There is thus a strong case for limiting unbundling requirements in time by relying on sunset clauses.¹⁰⁴ Such clauses can only produce the desired result if their subsequent enforcement is sufficiently credible. If market players are led to believe that local loop unbundling requirements will be extended the incentive to invest will be undermined. Of course, the adoption of a pricing formula for unbundled elements that is incentive neutral in terms of the "rent or build" decision of the entrant would justify the maintenance of unbundling requirements as investments would not be artificially delayed. The adoption of such an unbiased pricing formula is, however, likely to be difficult.

In addition, the reason which militates for limiting local loop unbundling in time also caution against extending unbundling requirements currently applicable to network elements in telecommunications to cable TV networks.¹⁰⁵ In a context of convergence the harmful effect created by adopting an interventionist regulatory attitude to those elements to which unbundled access must be granted are even more pronounced.

¹⁰² Such issues figured prominently - in the context of the Internet backbone providers - in recent antitrust proceedings triggered on both sides of the Atlantic as a result of the merger between Worldcom and MCI and the subsequent proposed acquisition of Sprint by Worldcom-MCI. The former proceedings led to MCI divestiture of its Internet business to Cable & Wireless whereas the second investigation resulted in the proposed merger being blocked. See further Commission Decision of 8 July 1998 declaring a concentration to be compatible with the common market and the functioning of the EEA Agreement (Case IV/M.1069 - WorldCom/MCI) OJ L 116/1. See also "Commission prohibits merger between MCI WorldCom and Sprint" Brussels, 28 June 2000, IP/00/668.

¹⁰³ See also European Commission - DG Information Society Working document "Unbundled Access to the local loop", Brussels, 9 February 2000.

¹⁰⁴ Such an approach has been pursued in the Netherlands. The regulatory authority OPTA has limited local loop unbundling to a period of five years to allow entrants to learn about the market and acquire a customer base making future investment in alternative infrastructure more likely. The idea is thus to promote a short-term policy of service-based competition in order to encourage the deployment of infrastructure-based competition in the long term. See further OPTA "Guidelines of Access to the unbundled local loop ('MDF Access')", 16 March 1999, paragraph 30-31.

¹⁰⁵ See further on this issue T. Kiessling and Y. Blondeel "Effective Competition in European Telecommunications - An Analysis of recent regulatory developments" *Info*, Vol 1, No 5, October 1999, at 435.

It should, however, be emphasised that following the advent of network convergence the issue of unbundled access will not have become entirely redundant if as a result of market forces most customers decide to switch to the same network.

3. Cross-subsidisation: Does convergence increase or reduce the risks?

The risks sometimes associated with cross-subsidies should probably not be exaggerated. First, it is worth reminding that transfers of resources between different economic activities belong to normal commercial practice and contribute to the furtherance of competition by facilitating the entry of new competitors on the market. Cross-subsidies are only of some concern when pursued by an undertaking possessing substantial market in one area as part of a strategy to extend it to another. Moreover, even in this situation it should be borne in mind that a profit maximising firm does not necessarily have an incentive to forfeit profits in non-competitive markets in order to cover losses in a competitive market. In addition, the firm invites entry on the non-competitive market by artificially increasing its costs. Consequently, the incentives to cross-subsidise will most probably diminish over time. The circumstances in which a strategy of cross-subsidies will be successful are thus relatively rare. The question has hence legitimately been raised by some, as to whether a special ban on cross-subsidies extending beyond a prohibition to engage in predatory prices is at all necessary.¹⁰⁶

A justification for preventing cross-subsidies as such may be derived from the fact that the non-competitive market is sheltered from competition as a result of exclusive rights having been attributed to the undertaking in question. In such circumstances, no entry is possible. The incentive to cross-subsidise is further increased in the event that a fraction of the cost of the firm in the reserved sector is reimbursed by the State.¹⁰⁷ However, it is in reality the existence of exclusive rights rather than cross-subsidies as such which is problematic in this context. Moreover, it is worth pointing out that in such circumstances the activities on non-competitive markets will often be subject to tight price controls which restrict the ability to engage in cross-subsidies. Price cap regulation, for instance, is generally recognised as discouraging cross subsidisation.¹⁰⁸ Indeed, price cap regulation provides not only a strong incentive to reduce costs since the firm can retain the additional profits thereby generated but equally prevents the financing of below cost prices in competitive markets by charging higher prices in non competitive markets.

It can hence be argued that the fear of anti-competitive cross subsidies associated with network convergence - for some of the reason set out above - does probably not warrant a tightening of existing rules on cross-subsidies. It would thus be misconceived for instance to advocate the adoption of structural remedies to deal with perceived problems of cross subsidies.

This being said it should nonetheless be stressed that the issue of cost allocation is likely to become more prominent in a context of convergence. One should take into account here the fact that the proportion of marginal cost as compared to fixed cost is relatively minor in the communications industry. As a result of convergence the proportion of those fixed cost that are common costs will increase in that the same infrastructure will be able to support a growing number of applications. The problem of cost allocation will become severe.

Again, it should be noted that cost allocation is relevant not only to the determination of cross-subsidies but also in one form or another to other alleged anti-competitive pricing behaviours. As is well known, the issue is notoriously vexed and some economists have even gone as far as to suggest

¹⁰⁶ See for criticism in this respect M. Bronckers, *supra* note 59, at 103.

¹⁰⁷ See J.J. Laffont and J. Tirole, *Competition in Telecommunications*, MIT Press, 1995, at 145.

¹⁰⁸ See for instance J. Hausman and T. Tardiff, *supra* note 61, at 537

that all methods for the allocation of common fixed costs are arbitrary.¹⁰⁹ It is perhaps more appropriate to say that the choice of a cost allocation rule ultimately depends on the incentives that as a matter of regulatory policy ought to be promoted on the market. At one extreme, a cost allocation rule based on Ramsey pricing gives great flexibility to the network operator and enables it to allocate the highest proportion of the cost where the price elasticity of demand is low. Alternatively, a cost allocation rule based on the stand-alone cost of the activity provided would prohibit even the mere exploitation of economies of scope generated by the multifunctional utilisation of the network. It is submitted that leaving such things to be decided on an ad hoc basis not only undermines legal certainty but also may also not be commendable from a regulatory policy point of view. Some clear guidance on this issue would thus be welcomed if only to promote a predictable regulatory environment.

4. The creation of new bottlenecks (set top boxes): Is competition law sufficient?

By allowing any type of message (data, voice video) to be reduced to a numerical format digitalisation has encouraged the development of more sophisticated forms of interaction between service providers and end users. Complex interface equipment - in the form of set top boxes - between service providers and end-users have been put on the market. Essentially, three types of facilities can be singled out: conditional access system, electronic programme guides and API. Conditional access systems allow end users to decode services to which they have subscribed either on a one-off basis or via subscription. Electronic program guides can be equated to navigation tools facilitating end-users to select amongst an abundant service offering. API can be compared to the operating language of the set top box.¹¹⁰

In the multimedia market where control over customers as such is proving decisive access to such technology becomes fundamental. The debate over open network provision is thus to some extent supplemented by that of access to customer interface devices.

Some concern has been voiced that these digital gateways could evolve into a new bottleneck in the communications sector. Anti-competitive concerns are often attributed to the first mover advantage from which the first market entrant is said to benefit. Indeed, the introduction of digital gateways to the market is generally preceded by heavy investments that, in turn, make it necessary for a manufacturer to persuade a large number of buyers to opt for its system. Consequently, the entry on the market of a second operator is rendered more difficult as a result of the reluctance of users to purchase a second decoder.¹¹¹ A risk of anti-competitive practices is said to arise since the operator of the digital gateways is in all likelihood also present on the downstream market and in a position to prevent entry of its competitors or to grant such entry only on less attractive terms. This risk and the accompanying concern of media pluralism is said to justify the introduction of sector-specific rules to ensure fair and non-discriminatory access of service providers to such digital gateways.¹¹²

The case in favour of such regulatory intervention is, however, not unassailable. To begin with it is important to stress that the incentive which encourages firms to embark on the high risk venture of developing this costly technology rest to some extent on the possibility to gain a first mover advantage. The possibility to gain transitory market power and to charge supernormal profits as a

¹⁰⁹ See W. Baumol "Predation and the Logic of the Average Variable Cost Test", *Journal of Law and Economics*, Vol XXXIX, p59.

¹¹⁰ See further C. Campbell and C. Marsden "Convergence, Competition and Regulation", *International Journal of Communication Law and Policy*, Issue 1, Summer 1998, p 7, available at <http://www.digital-law.net/IJCLP/1_1998/index.html>.

¹¹¹ This finding has also been made by the European Commission. See Commission Decision (IV/36.539 - British Interactiv Broadcasting/Open) O.J. (1999) L. 312/1 at para. 176.

¹¹² See further CRID, *Telecommunications et Audiovisuel: Convergence de vues? – Enjeux et conséquences juridiques de la convergence entre les télécommunications et l'audiovisuel*, Ed S. Bazzanella & P. Gerard, La Chartre, 1997. See also N. Nikolinakos "The New Legal Framework for Digital Gateways - The complementary nature of competition law and sector specific regulation" (2000) *European Competition Law Review*, and the reference cited therein.

result of such first-mover advantage should not as such be of any concern. Drastic intervention could produce detrimental effects by reducing the incentives that spurred the innovation race in the first place.

However, first mover advantages can in certain circumstances raise some concern.. Such would be the case if the advantage conferred is permanent in that the prospect of subsequent entry can be discounted however poor the performance of the first entrant. Two observations should nevertheless be made in the present context. Firstly, the firm that first enters the market is not necessarily in a position to exclude others from access to its platform since the attractiveness of its equipment depends on its accessibility. The need to gain customer loyalty thus limits the potential of exclusionary practices.¹¹³ Secondly, the entry of a second operator is not excluded as a result of the customer's reluctance to acquire a second decoder. The second entrant can force its access onto the market by aggressively subsidising the purchase of its decoders or alternatively by renting them out. In France, for example, both TPS and ABSat have established competing systems to that operated by Canal +.¹¹⁴

It can thus be suggested that the introduction of sector-specific rules that, for regulatory purposes, would assimilate all such digital gateways to essential facilities to which access must be granted to competitors may unnecessarily diminish the incentives to invest in such technologies. A more balanced application of competition rules is thus to be preferred.

It is worthwhile remembering in this context that competition rules do not lend themselves solely to *ex post* enforcement but equally permit *ex ante* scrutiny of certain market developments. It is precisely the *ex ante* application of competition rules that is arguably the most important in the present context. Since competition in this sector occurs not as much in the market as for the market, the latter form of struggle deserves as much protection as the former. Competition for the market can, above all, be compromised of strategic alliances or mergers taking place between potentially competing innovating firms. These operations thus warrant stringent scrutiny. That the issue is being taken seriously can be gleaned from the fact - for instance - that the European Commission has seen fit to prohibit a certain number of mergers in precisely this area.¹¹⁵

A further argument that militates against sector-specific rules should be mentioned. It rests on the fact that such sector-specific rules risk to be rapidly overtaken by the sheer rapidity of technological developments where alleged bottlenecks appear only to disappear and be replaced by alleged new ones. Increased reliance on competition rules will therefore - if anything - become inevitable due to the rigidity inherent in adapting sector-specific rules to match rapid technological developments with appropriate regulatory responses.¹¹⁶ It may thus be expected that the application of competition rules to the communications sector will take on a more conspicuous regulatory flavour in the wake of convergence.¹¹⁷ This in turn will subject the application of competition law to intense scrutiny as the legitimacy of certain decisions will turn on regulatory choices rather than traditional antitrust analysis.¹¹⁸

¹¹³ See J. Temple-Lang "Media-multimedia-and European Community Antitrust Law" (1997) *Fordham Corporate Law Institute*, p. 439.

¹¹⁴ See N. Charbit "Le numérique en concurrence – les restructurations des opérateurs de télévision numérique sous le regard des autorités de la concurrence" (1998) *Gazette du Palais* 16 mai 1998 p. 8, at. p.11.

¹¹⁵ See Commission Decision 9 Novembre 1994 (IV/M.469 MSG Media Service) O.J. L. 364/1, Commission Decision 27 May 1998 (IV/M.993 - Bertelsmann/Kirch/Premiere)O.J. L. 53/1, Commission Decision 27 May 1998 (IV/M.1027 - Deutsche Telekom/BetaResearch), O.J. L. 53/31. For an excellent discussion on these decisions, see P. Larouche, "EC Competition Law and the Convergence of the Telecommunications and Broadcasting Sector", (1998) 22 *Telecommunications Policy*, at 219.

¹¹⁶ See H. Ungerer, *supra* note 20.

¹¹⁷ This trend can already be observed in decisions taken by the European Commission on proposed merger and strategic alliances in which the conditions imposed read like an *ad hoc* regulatory framework.

¹¹⁸ For a in depth discussion of this issue see P. Larouche, *supra* note 25, pp. 322-58.

4 CONCLUSIONS

The strongest rationale for regulation rests on the control of market power. Under the current state of technological development incumbents still hold market power on local access exchange. This might prevent competition in public switched telephony services and impedes the development of broadband applications. Regulation might thus be needed to protect users and new entrants. However, if the process of convergence unrolls, alternative networks could become available thereby reducing both the market power of the incumbents and the need for regulation. A certain number of regulatory changes could, however, be necessary to encourage rather than deter the investments that are required in order for the process of convergence to unroll and its benefits to be reaped. The challenge will thus be to design such regulatory relaxation without compromising the welfare of users.

Moreover, this is not to say that in a situation of fully-fledged convergence no concerns exist. Old bottlenecks could remain or reappear (e.g., interconnection). The appearance of new bottlenecks could be witnessed. Inevitably, however, it will be difficult to keep pace with the sheer rapidity of technological developments. Any sector-specific regulation could be outdated by the time it has made it to the statute book. Reliance on competition rules will become more pronounced.