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Regulation for next-generation technologies and markets[☆]

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Abstract

Intense technological dynamics is perturbing the classical liberalisation course of fixed telephony markets followed in most national policies. Major shifts in the distribution of production costs of regulated firms are induced by modern microelectronics, photonics, and fixed and mobile internet platforms, creating new networked service markets adjacent to the regulated telephone activities. The confluence of regulated and unregulated markets poses dilemmas in deciding on issues of open access to the new opportunities for competitive providers and/or consumers. This contribution briefly discusses the general regulatory issues and two specific cases, namely, fixed-mobile service integration and licensing of third-generation mobile networks. © 2000 Elsevier Science Ltd. All rights reserved.

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1. Introduction

After the opening of the telecommunications market in the European Union (EU) on January 1, 1998 and in many countries around the world, a number of fundamental questions still have to be answered about the most appropriate way(s) to ensure rapid replacement of regulated monopoly providers by a sufficient number of competitive firms. For decades, diametrically opposite virtues, issues and legal foundations of the initial monopoly and the ultimate ideal of a competitive telecommunications market were studied and debated by academics. Now more practical problems posed by dynamic, but uncertain markets in transition are upon us.

It seems apparent that the technological dynamics and economic characteristics of the liberalised communication sector(s) must be better observed and analysed in a more effective manner. Digital information and communications technologies (ICT) offer a unique combination of innovative

[☆]This paper builds on earlier work on the same theme, notably, Arnbak (1997, 1998).
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features and options with substantial economic significance:

1. transport with the speed of light (unlike pipelines, rails, roads, etc.);
2. transport without loss of quality and value (unlike electric power);
3. instant copying/broadcasting, bundling and re-routing/refiling of information (unlike the mail, printing and publishing sectors);
4. complementary customer-access options — choice between wired access (with strong economies of scale, scope and/or density) and wireless networks (with area-coverage abilities, e.g. cellular mobile networks, broadcasting with or without conditional access);
5. lightweight/portable terminal devices (unlike sea, air and rail networks).

In competition terms, such factors determine relevant geographical markets (which can be much larger than a national or even European jurisdiction) and novel product markets (with, for instance, the ability to bundle products or services on converging markets). Accordingly, this sector differs fundamentally from other networked economic sectors, such as power distribution or airline transport. This short article attempts to open a discussion of some related regulatory dilemmas more widely than they generally take place.

2. The dynamics of technology trajectories and production costs

Clearly, a purely engineering approach to public telecommunications arrangements is no longer appropriate. Such approaches dominated virtually all of the incumbent operators in Europe (and former European colonies), as well as the ‘Bell System’ in North America. Still, I submit that neither telecommunications legislators nor National Regulatory Authorities (NRAs) can neglect the potential implications of new technologies, when considering the rights and obligations of telecommunication operators and ‘their’ customers. In particular, the dynamics of technology costs require special attention. Novel approaches to transmission and switching, such as Asynchronous Transfer Mode (ATM) and the suite of Internet Protocols (TCP/IP), change network economics radically from inside. Where sufficient economies of scale can be achieved with optical cables, the marginal cost of long-distance transmission now tends to zero. This ‘death of distance’, in turn, reveals the increasingly dominant cost of the local networks providing access to individual customers. When traditional benefits and costs are shifted to different user communities, or to other parts of communication networks, requirements for modifications of the regulatory framework for public control of tariffs and access obligations are likely to arise.

The ongoing innovation of information and communication technologies only seldom decides the resulting products and services in the market place unilaterally. Since the mid-1980s, the exponential improvements of each successive generation of very large-scale integrated (VLSI) microelectronics, predicted by G. Moore in 1964, combined with more general cost reductions of mass production and price benefits of fierce competition in consumer electronics, could be passed on directly to the buyers of PCs and cellular phones. VLSI-based mass production brought affordable, yet highly advanced professional terminal features within direct reach of consumers, as evidenced by the entry of standardised fax terminals into private homes in the last decade. Another positive network externality captured in a mandatory standard was the ingenious use of ‘smart-card’ technology in the European GSM standard. This particular standard for mobile

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