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Regulation of New Economy Markets - The case of Wired Residential Internet Service Provision

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Introduction¹

The ISP market in Ireland is relatively immature. Although Ireland's first Service Provider IEUnet was established in 1991, it is only in the last two or three years that a choice of provider and access price points has emerged under the regulatory regime of the Office of the Director of Telecommunications Regulation (ODTR). This has been achieved through the introduction of a telecommunications licensing regime by the ODTR, the specifics of which are available from the ODTR website.² From a position where there was only one telecommunications operator, the former PTO³ namely Eircom, there are currently 77 other licensed operators (OLOs) in the State. The regulation imposes on ISPs that provide the initial connection to the Internet the need to obtain a licence. ISPs that provide portal sites and search engines but not the telecommunication access to the user - like international companies Yahoo and Alta Vista, or Irish companies like Ireland.com - are not required to obtain a telecommunications licence. This form of ISP provides services after the initial connection to the Internet is made.

The ISPs under investigation here are those that supply the initial physical connection to the Internet as well as access to the World Wide Web. This level of Internet connectivity constitutes a telecommunications service and thus an operator requires a telecommunications licence.⁴ We further focus on the market specifically for residential Internet service provision.

Regulatory rationale for telecommunications

Why is regulation of the telecommunications sector necessary and how and why have these regulations changed in recent years? According to Geddes (1999) public utilities in general have 'network' structures, for example extensive distribution systems of lines or pipes. Utilities also have substantial sunk costs associated with these networks. Moreover, there is, in any particular utility sector - electricity, telecommunications, water distribution, etc. - need for no more than one network. As a result utilities have typically been granted legally enforced monopolies over their service areas.

Recently however utilities have experienced regulatory reform in the shape of increased competition through more liberal entry. According to Geddes (1999), new technologies in the telecommunications sector have made the old regulatory regime unworkable. 'Where once regulated or government owned monopolies dominated because of the belief that most utilities were 'natural monopolies', there is now a growing consensus that competition can perform a broader and more effective role' (Geddes, 1999: 1162). This liberalisation typically involves the separation of network provision from the services sold over the network (OECD, 1996). To study the wired residential ISP market, therefore, both telecommunications network provision and Internet service provision must be examined.

There are many arguments for and against market regulation, an investigation of which is beyond the scope of this paper.⁵ What we will do here is to briefly compare the arguments of Chang (1997), a political economist, with those of Martenson (1998), a chief executive in the Finnish telecommunications industry. This will be followed by a

¹ While the details provided in this article are about a year out of date, the analysis - in particular of the regulation - remains relevant.

² www.odtr.ie ODTR was restructured and renamed ComReg, the Commission for Communication Regulation, on 1st December, 2002.

³ Public Telecommunications Operator

⁴ See Heiberger (1998) on different levels of Internet service provision.

⁵ See for example Jacobson and Andréosso-O'Callaghan (1996, pp.82-87, 272-282).



brief discussion of regulatory reform of telecommunications in New Zealand, Australia, Chile and Guatemala.

Chang (1997) comments that many professional organisations impose their own 'self-regulation'. Therefore many markets which may appear to be regulation-free are in fact heavily regulated, although not necessarily by a governmental agency. The choice between self-regulation and imposed governmental regulation is, he says, a matter of 'relative efficiency'. That is, a governmental approach to regulation may be cheaper because of scale economies in information processing and enforcement.

Some types of deregulation may actually require increased government intervention. This can clearly be seen in the recent tendency of many governments, including that in Ireland, to apply more severe regulations to incumbent firms than to new entrants (asymmetric regulation) in certain industries such as telecommunications. This generally follows a belief that the incumbent firm is in a position of relative market power which it may unfairly exploit in the absence of additional regulation. For example, the ODTR has voiced concerns that Eircom, as the previous monopoly incumbent in telecommunications, is favouring its own subsidiaries such as Indigo in the new competitive regime, thus justifying regulation.

In terms of technological progress, Chang (1997) maintains that it can lead to the 'unbundling' of natural monopolies, 'which makes deregulation of certain segments of the industry feasible and desirable - as seen in the recent developments in the electricity and telecommunications industries'. Technological advancement may also, according to Chang (1997), lead to the blurring of industry boundaries, such as has occurred between the computer and technology industries and which may require existing regulation to be 're-packaged'. The emergence of entirely new markets due to technological change may also require timely regulatory intervention. 'All these suggest that regulatory regimes should not be taken as given, but be adapted to changing technological conditions in a dynamic way' (Chang, 1997: 721).

Martenson (1998) - against the backdrop of a telecoms market in which wired and wireless phone penetration is above 100 per cent⁶ - argues that government regulation should be minimised. His view is that 'the longer the rules are in place, the harder it will be to scrap them'. This suggests that protecting new firms against the power of the incumbent will, even if it is desirable in the short term, go on for longer than it should. It is, in this view, better not to have such regulation in the first place.

With regard to the creation of a truly commercial market for telecommunications, Martenson (1998) observes that some important parts of the present EU telecommunications policy actually go against the concept of free enterprise. He comments that in a truly free market system each supplier would try to create and develop a market segment, which is different from its competitors. It is also in the nature of the market economy that any such challenger tries to become dominant in this segment while challenging new segments. It would be illogical, according to Martenson (1998) to label an incumbent position (such as Eircom in Ireland) wrong, a priori. Also, as economies of scale and scope develop, mergers and acquisitions will lead to bigger and bigger enterprises. If such developments are unwanted, there are, according to Martenson, general rules (competition law and mergers and acquisitions regulations) for stopping abuse. Only the users of telecommunications services should benefit from regulatory activity, not the operators who should face the threat of bankruptcy if they do not perform adequately.

Martenson (1998) is also critical of the attempts by the regulators to set accounting rules. The function of such rules, as pointed out by Harrison and Fisse (1997), is to prevent cross-subsidisation between different parts of the telecom business. This practice could enable the incumbent to operate at a loss in parts of the business where it has competitors. However, the rules can raise cost and technical accounting barriers to entry for small entrants attempting to operate between different elements of the telecom markets.

[D]efining for example where the - wire-line, cellular, DECT, xDSL, coaxial, etc. - 'access network' ends and the 'core network' starts is arbitrary, especially as the price tags on the hardware and software

⁶ As on average every adult has more than one (fixed or mobile) telephone.



may be set in any manner that makes sense for the equipment supplier... Especially newcomers and small companies should be free to keep their book-keeping simple (Martenson, 1998: 730).

The subdivision of technology, he believes, should be left to the individual firm, not dictated from 'on high'.

The guarantee of a particular level of service - a universal service - can only be achieved, according to Chang (1997) through regulatory intervention. Deregulation has up- and downsides. Chang (1997) mentions that those who may inevitably lose out in deregulation are the disadvantaged, customers who were subsidised under the old regime but are now often denied access to the service, or charged higher prices. He further remarks that such losses may be outweighed by the overall gains to the customer base as a whole - the 'compensation principle'. However, as the right to a universal service is guaranteed by the new regulation, even under a regime of 'pure' competition, all consumers must receive a specific minimal service.

According to Martenson (1998) the universal service provision actually prevents the development of a competitive market in telecoms in the sense that it is likely to enhance the position of the incumbent firm:

I have never heard of an incumbent who of his own free will hands over the customers to the competitors, who claim they are able to fulfil this universal service obligation more cheaply. In fact, network externalities are likely to be such that it makes sense for the incumbent to continue investing in order to offer the already connected subscribers more opportunities to call (Martenson 1998: 736).

Even in more 'essential services' such as running water or public transport, there is no mandate to provide a certain level of service, and 'the discussion about universal service obligation is conspicuous by its absence' (Martenson, 1998: 736).

In relation to the question as to whether telecom-specific regulation is necessary, Spiller and Cardilli (1997) comment that general competition law was found to be wanting when applied to problems specific to the telecom sector. They studied the attempts in New Zealand, Australia, Chile and Guatemala to move their telecom sectors towards full competition. These countries were chosen as they were among the first to liberalise their telecom sectors. There were also many similarities among them. For example, the incumbent providers were all state-controlled monopolies. Also, there was a political will to deregulate the market and push through radical reforms.

Chile and New Zealand proceeded using only general competition law; the problems they encountered led to Australia and Guatemala establishing dedicated telecom regulation. Thus 'the countries have learned from each other in the process' (Spiller and Cardilli, 1997: 127). What emerges is that there are three factors that result in the need for telecom-specific regulation, namely interconnection, equal access and unbundling. They are also the 'key building blocks that determine how quickly... competition will emerge once the telecommunications sector is demonopolized' (Spiller and Cardilli, 1997: 127-8).

To illustrate, interconnection costs for a new entrant can constitute half of total costs. It is typical in telecom markets that the incumbent is a former monopoly PTO with control over the network. In the absence of an *ex ante* interconnection mandate the telecom incumbent will be in a position to exert market power to a greater degree than most other former monopoly incumbents in market sectors outside of telecommunications (Harrison and Fisse, 1997: 3). Equal access and unbundling were also found to require sector specific (*ex ante*) regulation to avoid similar possible monopoly plays on the part of the former PTO incumbent (Spiller and Cardilli 1997: 129).

Interconnection, equal access and unbundling have also been identified by the OECD (1995), ETNO⁷ (1995) and the European Commission (1997)⁸ as crucial to the liberalisation of the telecommunications sector. The focus on these elements has also

⁷ European Telecommunications Network Operators Association

⁸ And thus also by the ODTR at the behest of the Commission



⁹ S.I. No. 338/1997

¹⁰ S.I. No. 15/1998

¹¹ S.I. No. 109/1998

¹² S.I. No. 180/1998

¹³ See Eircom Reference Interconnect Offer (RIO) Version 1.4

¹⁴ The Esat Local call rates have three bands, daytime 3p per minute, evening 2p per minute and weekends 1p per minute. However, the Esat rates used for pricing Internet access have two bands as applied to IOL Free, 4p per minute peak and 1p per minute off-peak respectively.

¹⁵ Peak rate access is zero at the subscription rate.

¹⁶ With regard to IOL Gold and Eircom.net, the on-line access times for £20 are calculated by subtracting the subscription costs and then calculating the on-line time for the remainder.

been transposed into Irish law by the adoption of the following statutory instruments:

European Communities, (Telecommunications Infrastructure) Regulations 1997⁹

European Communities, (Leased Lines) Regulations 1998¹⁰

European Communities (Interconnection in Telecommunications) Regulations, 1998¹¹, and

European Communities (Full Competition in Telecommunications) Regulations 1998¹².

How competitive has the ISP market become following the combination of deregulation and regulation that has been experienced in Ireland? One way of examining this is via pricing. All ISPs who use Eircom's network as a carrier for their Internet services are charged at the exact same rate¹³. The variance in costs comes only with regard to what level of usage an ISP requires of Eircom's network, but the rate is constant. Therefore all players are faced with the same price for access to the network. With regard to the end user prices for these services, the Regulator has left it to the discretion of the individual players. There are three possible mechanisms for the pricing of Internet access, flat rate access, subscription based access and free access. Those operators who supply ISP services via wireline in Ireland operate various combinations of these pricing mechanisms.

Competition, Pricing and Concentration

Three separate service bundles are available for Internet access. Below is a comparative table for Internet access with subscription fees included. The table is based on Nielsen NetRatings December 2000 Irish Internet usage report, which states that on average Irish Internet users spend four hours per month on-line. The figures for IOL Free and Ocean and Indigo are calculated for Eircom and Esat local call rates¹⁴.

	ISP SERVICE	PEAK TIME		OFF-PEAK TIME	
		Eircom	Esat	Eircom	Esat
FREE ACCESS	IOL FREE	9.60	9.60	2.40	2.40
	INDIGO	9.60	9.60	2.40	2.40
	OCEAN	9.60	9.60	2.40	2.40
SUBSCRIPTION	IOL GOLD	15.68		13.84	
	EIRCOM.NET	16.26		14.34	
FLAT RATE	IOL NO LIMITS	27.20		20.00	

**TABLE 1:
COMPARATIVE PRICING TABLES FOR
AVERAGE 4 HOURS INTERNET ACCESS.
PRICES ARE SHOWN IN IRISH POUNDS.**

Analysing the above table, we can see that the costs of 'free' Internet access for the end user are identical across the board. There is a small difference in costs of subscription-based Internet access.

As IOL No Limits is the only available flat rate service, relative pricing is not immediately obvious. Such comparison is possible, however, if all other Internet access offers are calculated on the basis of the IOL No Limits Internet access offer of £20 per month for unlimited off-peak access¹⁵. The access time on-line for each Internet access bundle is revealed at this price¹⁶.



	ISP SERVICE	OFF-PEAK TIME	
		Eircom	Esat
FREE ACCESS	IOL FREE	33.33	33.33
	INDIGO	33.33	33.33
	OCEAN	33.33	33.33
SUBSCRIPTION	IOL GOLD	17.39	
	EIRCOM.NET	15.79	
FLAT RATE	IOL NO LIMITS	Unlimited	

**TABLE 2:
ON-LINE ACCESS TIME AT £20 PER MONTH.
ACCESS TIMES ARE SHOWN IN HOURS.**

What the data indicate is that in order for flat rate access to be a viable alternative for consumers, they would need to be on-line at least 15.79 hours per month, the 'least amount of peak time on-line' alternative for £20 per month. Indeed, consumers could obtain up to 33.33 hours per month at this price if they subscribed to the free access option. However, there are potentially 210 hours of free (off-peak) access per month¹⁷ (7 hours per day), which, if accessed with a free subscription service (off-peak call charges only) would cost £126 per month. Flat rate access is thus positioned to attract extremely heavy users of the Internet, those who are going to be on-line considerably longer than the four-hour average of Nielsen.

It is reported¹⁸ that Internet users are 'likely to float between the subscription based ISPs and the free ISPs'¹⁹. This suggests that consumers see these products/services as being substitutable. However there are only two telephony Internet suppliers, Eircom and Esat. The fact that their access prices for both free and subscription based access are similar could be interpreted as behaviour indicative of collusive oligopoly. Is there other evidence for or against price collusion?

Among the functions of Regulator is to encourage as much competition as possible in telecommunications markets. There are currently 77 licensed telecommunication operators in the state, of which 11 operators hold a fifteen-year general telecommunications licence. These operators are engaged for example in the provision of wireless telecommunications access and the provision of international telecommunications links, but there is nothing to stop them entering the ISP market at any time. This suggests that the requirement for a telecommunications licence is not acting as a barrier to entry²⁰.

The potential for any of a number of companies to become competitors to Eircom and Esat in the ISP market can be taken as a degree of contestability that militates against collusive pricing. It is in fact entirely possible that the similarity in Internet access prices is indicative of strong competition; in the theoretical 'perfect' competition model free entry prevents any incumbent from extracting economic rents, so prices are as low as they can go and economic profits must be zero. This suggests that there is no agreement to keep ISP prices in Ireland artificially high.

On the other hand, could the prices for Internet access be too low? There is no predatory pricing (temporarily pricing below cost in order to wipe out opposition) in the market for household Internet service, as all Internet access offers, including 'free access', must cover the cost of the utilisation of the telephony network. The information on pricing thus suggests that while at first sight there may be grounds to believe that there is collusive price-setting, there is also evidence of a degree of contestability; this

¹⁷ Based on Hackwatch figures, 17th February 1999

¹⁸ Hackwatch, 11th August, 1999

¹⁹ Hackwatch, 11th August, 1999

²⁰ There may, of course, be other barriers to entry. Economists use the term 'contestability' to describe the ease with which potential entrants can become competitors to incumbent firms.



results in more competitive pricing than would be the case for an incumbent duopoly with barriers to entry.

A Herfindahl–Hirschman Index (HHI) measure (Jacobson and Andréosso-O’Callaghan, 1996: 54) using fixed line telecommunications market shares shows that while the fixed line telecommunications market, inclusive of Internet service provision, is still highly concentrated, concentration has declined significantly, from 0.88 to 0.70 over a period of just one year. (The closer the index is to 1, the greater the extent to which the market is dominated by a single firm.) The reciprocal of the HHI (i.e. 1/HHI) provides a ‘numbers equivalent’ (Lipczynski and Wilson, 2001: 110). These numbers are interpreted as the number of equal sized firms that would generate that HHI. Thus in March 2000 there were the equivalent of 1.14 equal sized firms and this had grown to 1.43 in March 2001. This is evidence of increasing competition in telecommunications, though does not really say anything specifically about the ISP market. Information on this market - though available to the ODTR - is not public.

Time when fixed line market share was measured	Market Share		(Market Share) ²		HHI Value Sum of (Market Share) ²
	Eircom	OLOs	Eircom	OLOs	
March 2000	.93	.07	.87	.01	.88
June 2000	.90	.10	.81	.01	.82
Sept. 2000	.85	.15	.72	.02	.74
Dec. 2000	.83	.17	.69	.03	.72
March 2001	.81	.19	.66	.04	.70

**TABLE 3:
HHI CALCULATION FOR FIXED LINE MARKET SHARE**

Source: ODTR Irish Telecom Market Quarterly Reviews March 2000-2001²¹

²¹ See www.odtr.ie

The regulatory approach to telecommunications in Ireland and indeed across the OECD has to date had one overriding purpose, to open the telecommunications networks of PTOs such as Eircom to full competition. This has been attempted by allowing open access to incumbent’s voice telephony networks. The ODTR has created a market for service provision by forcing Eircom to allow access to its telephony network on equal non-discriminatory terms to all OLOs. With regard to network competition the interest is in the development of the next generation of telecommunications architecture, namely ‘always-on’ broadband (inclusive of Internet) access, in relation to which there is a different regulatory policy.

The Future: Broadband Development

Bar et al (2000) and Lessig (2000) in separate examinations of the regulation in relation to open access in broadband networks in the US, both express concern that the current policy of open network provision is being abandoned. Cable operators in particular are being left with the power to determine which ISP their customers must use to access the Internet. This apparent absence of regulation in the development of broadband networks may have dramatic consequences for residential broadband users.



Bar et al (2000) distinguish three separate stages in the development of the Internet. Initially it was designed as a network for the sole purpose of allowing academics to send information via telephony lines/modems. The military also quickly took an interest, seeing its 'security' potential. This state of affairs lasted for nearly thirty years, from the late 1960s until the early 1990s. The second generation came with the commercialisation of the Internet, through the use of narrowband dial-up modems. The policy of open network provision to the telephony network made it possible for essentially universal commercial and residential coverage to be achieved, while the advent of the World Wide Web led to an explosion of commercial and social experimentation with on-line platforms.

The third generation is the broadband era, where slow narrowband access is being replaced with high-speed broadband applications, not just for commercial users, but also for the residential user. The major distinction between second and third generation is not just the multi-platform ability of broadband but also that it is a continuous stream, unlike the spasmodic nature of narrowband access.

The advent of residential broadband, 'always-on' access, is being made possible by the upgrade of local residential infrastructure, either in the form of high-speed modem or DSL telephony access, or by the upgrade of cable television networks. However, according to Bar et al (2000), policy in the US with regard to third generation development is in direct opposition to that advocated for first and especially second generation development. A policy of open network access, where OLOs could gain access to network elements 'on cost-effective terms' was seen to drive both competition and innovation for second generation platforms. However, broadband development is different:

The cable industry, that clearly dominates the early deployment of the Internet's third generation access infrastructure for the residential market, comes from a different policy tradition, where the cable owners control access to their networks. As cable moves from 'broadcast' to 'broadband', policy-makers are thus faced with an important choice: should the open access requirements developed for previous-generation be extended to the new broadband access infrastructures, or will competition among distinct third-generation access networks serve as a substitute for open access and continue to sustain wide-ranging innovation? (Bar et al, 2000: 490).

The fear of network foreclosure for third generation network development can be seen, according to the authors, by looking at the merger between AT&T and TCI which, at the time, was the largest cable operator in the US. By merging with TCI, AT&T gained control of Excite@Home, the number one provider of broadband cable access in the US. AT&T is arguing that it should be allowed to determine which ISPs have access over Excite@Home's network, '...just as cable operators have always controlled which video programs are sent over their network' (Bar et al, 2000: 490). Regulatory intervention would, according to AT&T, decrease the incentive of the network provider to upgrade its network. The counterpoint to this argument is being put forward by local telephony operators, seeking the retention of the same telephony network open access provision for broadband cable networks.

There is an argument that market forces, in particular direct network externalities, will eventually lead to cable operators opening their architecture. However, it is cable operators' ability to shape indirect externalities - the content - that is of immediate concern. This ability allows the cable operators to act as Microsoft have in the past, 'using its control of the operating system's architecture to favour some applications over others, with similar anti-competitive implications' (Bar, et al, 2000).

Irish Broadband Markets²²

The major wired cable operator in Ireland, NTL, has been granted an exclusivity contract for the supply of cable television services in its service areas, the most

²² Early in 2003 Eircom began to offer broadband, though only in selected areas. The thrust of the argument in this section remains unchanged, namely that Ireland has been a latecomer to broadband.



important of which is the Dublin metropolitan area. However, it has failed to honour the terms of its agreement with the ODTR, to have digital television and associated broadband services (Internet, telephony) up and running at this stage. This is due in no small part to NTL's under-estimation of the costs of broadband upgrades to the cable network it inherited when purchasing Cablelink, the costs being double (over IR£400m) the original estimate.

In relation to broadband roll-out in Ireland overall, neither of the two main telecom operators, namely Eircom and Esat, is in a position to offer DSL broadband. This is a direct consequence of the refusal of the ODTR to allow Eircom to offer digital television services as part of its broadband development. Eircom subsequently abandoned its DSL roll-out as it would not prove cost effective without the ability to offer bundled broadband services. As Esat is still reliant on Eircom for service carriage, any DSL development on their own would be of little use if Eircom's network was not also upgraded; any telecommunications network is only as fast as its slowest link.

It follows that there is currently no wired residential broadband Internet or other telecom service available in the state. There is a sharp contrast between the high standard of international telecom connections (Global Crossing and 360networks) and the relatively backward domestic situation. In many parts of Europe and North America 'always-on' residential access is already available. The regulatory approach of the government, which encouraged telephony based telecom competition, is hindering broadband development. 'This is particularly odd for a Government that has demonstrated its understanding of the value of creatively motivating business to do what you'd like done' (Lillington 2001a). The crux of the problem with regard to the roll-out of broadband is that outside of the major urban areas there is a distinct lack of development. This situation is made worse by the fact that '...no overarching planning authority exists to oversee infrastructure developments' (Lillington, 2001a).

Even with regard to second generation technology, Irish residential Internet access is still below the European average, coming in at between 17 to 22 per cent of households (Smyth 2001c). There is also a 'digital divide' between Dublin and the rest of the country. The current economic climate, spurred by a cash crisis among the major telecom operators who may have over stretched, is also affecting the roll-out of broadband. NTL is now to offer its digital television service over its existing network instead of upgrading it to broadband. This means that it will not be in a position to offer interactive services or more crucially 'always-on' broadband Internet services. 'This is a major disappointment, given that Dublin has the highest cable television penetration rate in Europe at 83 per cent and it was thought NTL would bring much needed competition to the Republic's market' (Smyth, 2001c).

In contrast to our argument about the market for provision of internet access, there is a distinct lack of domestic competition for bandwidth that is keeping prices at 'prohibitive' levels. 'In some cities, such as Cork, the existing network cannot handle additional demands. Other regions, such as most of Mayo and Donegal, lack fibre and, thus, are not in the running...' (Lillington, 2001b). For example, with regard to OLO local access, the other players initially targeted 28 exchanges for unbundled access, but the delay and costs of access mean that only Esat is now showing any interest in unbundling. Both the Regulator and Eircom are backing into a corner on the local loop issue, the former threatening to impose a mandatory interconnect price, the latter threatening legal action to ensure a recoup of network investment costs.

Six licenses to operate wireless loops have been issued by the Regulator. The only firm to actually introduce a local service, Formus, collapsed in April of this year. Chorus, the wireless cable specialist has introduced wireless 'always-on' Internet. 'However, it is understood that such services are available to a limited number of customers. The telecommunications regulator has also expressed concerns about Chorus's offerings, saying she received 300 complaints last year' (Smyth, 2001c). No real alternative to wired local access exists, even though both Esat and Eircom have wireless local loop licences.

The EU/Irish government approach to telecommunications competition has been to use threats rather than incentives. The ODTR has given Eircom one month to put



forward terms for access to the local loop. The Regulator ‘...felt that there had been unnecessary delays in the unbundling process and expressed dismay that ‘relatively straightforward’ issues had needed regulatory intervention’ (Smyth, 2001a). A final report on the issue of unbundling is due shortly. Access to the local loop is to be achieved through bitstream access. NTL will offer a limited digital television service, though less than under the terms of its licence. Finally, the National Development Plan’s aims for broadband have also become unhinged as key players such as Eircom back out of their plans:

Privately, many State officials express concerns that broadband development internally has lumbered to a standstill. Unless the snags are sorted out, the situation could begin to affect the perception of the Republic as an attractive location for companies, especially the high-value technology companies focused on research and development (Lillington, 2001b).

Conclusion

There was an apparent regulatory dichotomy: the breaking up of one former monopoly, Eircom, while granting certain OLOs exclusive rights over certain service bundles allowing them to act as *de facto* monopolies in specified local markets. This situation was compounded by the fact that the principal holder of exclusive rights, namely NTL, did not deliver the services it was legally bound to deliver. The ODTR could possibly have solved this problem by allowing the former PTO deliver these services. Its failure to allow this resulted in Eircom completely abandoning its broadband upgrade. This directly affected those OLOs who relied on Eircom for service carriage. As there was no national alternative broadband architecture, ISPs were still locked into the delivery of spasmodic residential Internet access, which continued to hinder access from the home.

In this paper we have discussed the changes in the regulatory environment necessitated in part by changing technology and in part by political processes. We have shown how the telecommunications market in particular has behaved. As in other countries, the Irish PTO, Eircom, was forced to accept increasing competition. In relation to narrowband access to the Internet, there is an increasing level of competition. We have also shown, however, that in relation to the development of broadband, ‘always on’ access to the Internet, the Regulator in Ireland seemed to have stumbled. Among the fundamental issues for future research are whether the European model of regulation is appropriate in a market for Internet access as small as Ireland’s; what the alternatives are to local cable monopolies; the extent to which natural monopolies exist in Irish networks, both at the local and national levels; and how open access - as with narrowband - can continue to be provided through cable operators.

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