Investment incentives and local loop prices

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One of the objectives of the new regulatory framework for electronic communications services in the EU is to 'promote competition in the provision of electronic communications networks, electronic communications services and associated facilities by *inter alia*: …. (c) encouraging efficient investment in infrastructures and promoting innovation….'[1]

In relation to the local loop, this can be considered in either of two contexts –a static one and a dynamic one. In the former sense we can ask what are the prospects for competition. This issue has been addressed in the UK and a description of fifteen access technologies is contained Ofcom's Strategic Review of Telecommunications Phase 2 (November 2004). The technologies are listed in an Annex to this paper, and the Review's commentary on them is as follows:

"The current generation access network:

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[1] Framework Directive, Article 8.2.

7.15 The considerations concerning the regulated returns that BT should be permitted to earn from its current access network are very different from those concerning the core network.

7.16 The relative importance of incentives to invest is low. It is important that BT is not disincentivised from investing in next generation access networks, and we consider this below. But the current generation copper access network is already in the ground, and little new investment beyond incremental investment for new-build properties is in prospect.

7.17 Much of the copper access network is not contestable by competing network providers, and as a result there is a strong need for direct consumer protection. The market reviews completed by Oftel and Ofcom found that competition in access networks from mobile and cable does not constitute effective competition to BT in many markets. Therefore in these markets, direct regulation on the return that BT is permitted to make on its assets is the principal means of consumer protection."

"Next generation access networks

8.49 We define next generation access networks broadly to be those that go beyond the capabilities of the existing copper, cable and wireless public networks that exist today. They will allow the delivery of much higher bandwidths to consumers, and in consequence the delivery of much richer services. Next generation access networks have not yet been deployed on any scale in the UK, though private networks and dedicated leased lines with similar capabilities are supplied to some high value business customers.

8.50 We understand that operators are likely to take a phased approach to deployment of next generation access networks. Initially, operators are likely to deploy improvements to DSL and other current generation technologies which do not require major new network roll-outs. This approach may be restricted by geography, and only available to customers a certain distance from their local exchange. At some point, if operators are to offer increased bandwidths to a reasonable proportion of customers, they will need to roll fibre out beyond the local exchange to the cabinet. Ultimately, fibre may be deployed to the kerb or the premises for some customers.

8.51 Some wireless technologies may also be used to provide next generation broadband access. These are likely to use high frequencies, and may use mesh architectures due to the propagation characteristics of these frequencies. Many of these technologies appear very promising, and in Annex Q we summarise the access technologies that we have assessed as part of our analysis. While we will facilitate market entry based on the use of such technologies, we consider that their business cases are too uncertain at present to assume their roll-out when formulating our regulatory strategy."

"Prospects for roll-out

8.56 In some countries, fibre in the local loop has been or is being deployed extensively. But these countries all have different demographic, competitive or political environments to the UK. For example, the roll-outs of fibre in some countries are the result of public subsidy; other countries have ubiquitous cable networks competing with the PSTN and driving new investment; and for others investment in new fibre networks is the path to entry to a market which has previously had little or no competing infrastructure."

Other tentative analysis (based on cost modelling) suggests that new wireless technologies, such as Wi-Max, may have a problem in the UK in that they appear to be best suited (from a competitive standpoint) for extra-suburban areas, yet the resulting market in the UK may not be adequate to sustain them, if various improved versions of DSL capture the lion's share of urban and suburban markets. Moreover, Wi-Max is unlikely to exercise a major competitive challenge for several years, until standards issues have been revised, equipment costs have come down, and spectrum assignments have been confirmed.

France, of course, has a different geography, characterised by lower average density, and a higher proportion of the population in sparsely populated areas. On that footing Wi-Max might have better prospects if the cost of base stations is low enough and their service radius large enough. Given the range of opportunities available, the benefits new technologies can bring, and the harmful effects of a bottleneck local loop, it would involve a sacrifice of large potential benefits not to encourage competitive loop investments.

A delay in competitive access investment does not rule out competition, however, and this is the context of the ideas set out in the European Regulators Group's *Common position on the approach to appropriate remedies in the new regulatory framework* (2004). That paper emphasises the objective of promoting innovation and encouraging efficient investment.

It then goes on to draw a distinction between cases where consumers have to be protected because the assets providing the services cannot be replicated and hence they are exposed to excessive pricing, and cases where it is feasible to support infrastructure investment by competitors. In the latter case, as one of the recitals in the Access Directive states,

> '…the imposition by national regulatory authorities of mandated access that increases competition in the short-term should not reduce incentives for competitors to invest in alternative facilities that will secure more competition in the long term.'

The ERG paper suggests in relation to one-way access that:

> '…new entrants can decide on their investment in a step-by-step way and can establish a customer base (critical mass) before they go to the next step of deploying their own infrastructure. In those areas where infrastructure based competition is feasible, such interventions have as their long-term objective the emergence of self-sustaining effective competition and the ultimate withdrawal of regulatory obligations.

In application to current generation broadband, based on DSL, the argument might go as follows:[2]

[2] For more detail see M. Cave *Encouraging infrastructure competition via the ladder of investment*, (revised) August 2005.

The network inputs required to provide broadband services over copper lines using an ADSL (asymmetric digital subscriber line) technology are shown in Figure 1

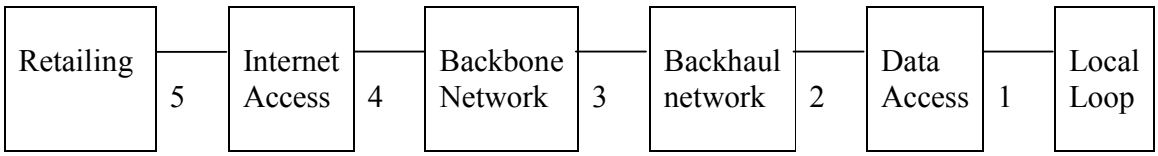

Figure 1: Broadband Services

From the right, customers are connected to the exchange by the local loop. They get access to the data network at the local exchange using Digital Subscriber Line Access Multiplexes or DSLAMs. Data are conveyed deeper into the network from the local exchange by a backhaul network, to the operator's backbone or core network which then gives access to the internet. A retailer provides marketing, billing, help-line and other functions.

Competition in broadband can take many forms. A cable operator, for example, can provide an end-to-end service. However, in the case of a rival telecommunication operator, such a policy would require it to duplicate the local loop. Accordingly, competitors usually purchase services from the incumbent at one of the number of points shown in the figure:

1. here the competitor leases an unbundled local loop from the incumbent, providing all other services itself.
2. the competitor uses the incumbent's data access facilities (DSLAMs) at the exchange as well as the loop.
3. the competitor also relies on the incumbent for backhaul into the core network.
4. the competitor also utilises the incumbent's network giving access to the World Wide Web.
5. the competitor simply "resells" (ie markets under its own name) the incumbent's complete broadband product.

How can regulation articulate the supply of a range of wholesale products of this kind, in order to promote infrastructure investment?

The level of replicability of the various inputs in the value chain is probably in the reverse order from the above, with entry into retailing easiest, and replication of the local loop the hardest.

This may imply a regulatory policy of initially setting relatively low access prices for the assets which entrants will find it hard to replicate, but raising those prices as entrants accumulate customers and other assets on a scale which makes replication feasible. On this footing a low but (prospectively) rising unbundled loop price would promote upstream investment in IP networks and backhaul, by making the non-replicable input

cheaper. As investment in the more replicable assets occurs, and competitors achieve a critical mass, it may be possible to provide an alternative wire-based or wireless loop. This would require a review of the need for a regulated price of unbundled loops, for which a feasible substitute would then exist.

This policy is explicitly adopted by Ofcom, which has succeeded in increasing the margin between prices of entry at points 4 and 5 (BT's IPStream) and point 3 (Datastream), has cut migration charges from entry point 4 to 3, and now proposes to cut the price of unbundled loops, by (*inter alia)* reverting to HCA copper valuations. Moreover, BT has agreed not to reduce its IPStream prices until 1.5 million local loops have been unbundled.[3,4]

The dominant operator's set of prices for wholesale broadband access and wholesale broadband products is likely to be subject to prohibitions of margin squeezes under competition law and/or under anti-discrimination obligations flowing from Article 10 of the Access Directive. The price of the local loop, at the bottom of the 'cost stack' for more comprehensive products such as bitstream or wholesale broadband, thus plays a pivotal role in the prospects for broadband competition.

This approach suggests that in valuing copper, and thus in setting the price of the local loop, ARCEP should be alive to its implications for the set of wholesale broadband

[3] Ofcom, *Broadband regulation*: Statement of 30 June 2005.
[4] The situation in the UK is complicated by the existence of a rival access network, cable television, which passes about 60% of homes. Despite this, Ofcom is promoting DSL competition based on BT's unbundled loops.

products. In the medium term, the prospects for replication of the local loop may improve, but they will also be enhanced over that time period by policies designed to encourage France Telecom's competitors to adopt intermediate solutions which involve lower levels of infrastructure investment.

Annex: Ofcom's list of access technologies

Proprietary wireless (below 10 GHz)

Proprietary wireless (above 10 GHz)

Proprietary mobile

Standardised Wireless Local Area Networks (WLAN)

Standardised Wireless Metropolitan Area Networks (WMAN)

Standardised mobile

Mesh wireless

Satellite

High Altitude Platforms (HAPS)

Broadcast wireless

Free Space Optics (FSO)

Powerline Comms (PLC)

Future DSL (Digital Subscriber Loop)

Future Cable

Fibre

Source: Ofcom, *Telecommunications Strategy Review Phase 2,* Annex Q, 2004.