Pricing principles for the unbundled telecoms local loop

Recognising how costs should be calculated and applied is not easy

by ***Matteo Aquilina****

There have been many disagreements about local loop access prices, which are an important issue for both asset holders and those wishing to enter telecommunications markets.

The charges that an incumbent fixed-line operator is allowed to recover from those seeking to use the assets that make up the local loop are regulated on similar principles in many jurisdictions.

These principles often translate into prices that are intended to be cost-based, non-discriminatory, non-predatory and not inflated so that competition is reduced in dependent markets. Economic theory shows that if prices reflect the above conditions, social welfare should be maximised. The practical difficulties and disputes come in recognising how costs should be calculated and applied.

The use of LR(A)IC models

In recent years, regulators in many jurisdictions have attempted to achieve the above objectives by calculating the access price to the local loop of an incumbent fixed-line operator on the basis of (bottom-up) Long Run (Average) Incremental Cost – LR(A)IC – models.

These models attempt to estimate the cost that an efficient new entrant would incur in providing the service. For this reason, LR(A)IC models are usually built starting from a blank sheet, disregarding (at least, partially) the network topology of the incumbent operator and replacing existing assets with their modern equivalent.

In practice, however, the topology of the network is usually taken into account in that the existing number and location of switching nodes is taken as given (the "scorched node" assumption) so that costs have a link with the network that the incumbent operates and the new network is not completely unconstrained.

LR(A)IC models have three main characteristics. First, the increment in this context is not an individual call, or minute, but the whole bundle of services provided by the local loop. (This is a point that can lead to confusion among those accustomed to other definitions of "increment"). Second, "long run" means a period where all factors of production can be varied, as opposed to the short or medium run, where the amount of at least one factor of production (usually capital) is fixed. Third, the LR(A)IC concept is a forward-looking one – that is, all costs of productions should be assessed as the costs that would be avoided at the time of model building if the service were not provided.

A price determined on the basis of a LR(A)IC model, if correctly applied, may give a potential entrant an efficient "build/buy" signal as it would reflect current knowledge and technology rather than the one used when the network was originally built. If a new entrant believes that, by building its own network, it can be more efficient than the cost level implied by the model, then it would invest in new infrastructure and build its own network (build). On the other hand, if it believes that it would not be as efficient as the cost level implied by the model, then it can get access to the incumbent network and provide the services to its consumers (buy). In this sense, LR(A)IC models are thought to obtain the objective of maximising welfare since prices reflect the opportunity cost to society to build a new network.

However, an access price calculated on this basis implicitly assumes that the assets making up the network are, in fact, replaced since the network is rebuilt at the beginning of every regulatory period. This makes realistic sense in the context of core telecommunication networks, in which the switches and other computing equipment are continually being improved. In particular, when telecommunications market were initially liberalised, SDH (synchronous digital hierarchy) transmission technology was the modern equivalent of PDH (plesiochronous digital hierarchy) transmission technology. Today, IP technologies are completely overhauling not only switching but also transmission technologies.

For access networks, however, this assumption gives rise to a number of potential issues. Access networks consist of copper cables (laying underground or hanging on poles) of different sizes connecting the subscribers' concentrator units (where a line card for each customer is located) to the customer's premises. The copper cables start from the concentrator and gradually separate at distribution cabinets, becoming thinner and thinner until they reach the last distribution point where the last drop of cable departs to get to the customer's premises. The cable network usually follows the road grid.

The majority of the cost of rebuilding an access network is therefore represented by the current cost of digging trenches, placing the ducts and cables and resurfacing. For this particular asset, there is no modern equivalent: a trench is likely to be dug today using techniques that are not very different from those that were used to dig a trench 40 or 50 years ago.

In addition, while at the time when the network was originally built, it is likely that a considerable share of trenches were dug on unpaved roads, this is not the case today in

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countries where the degree of urbanisation is higher and so is the share of roads that are paved. Furthermore, the cost of the labour necessary to lay the ducts and cables in the trenches is also likely to be higher (even in real terms) than it was when the access network was originally built, given the increasing trend in real wages.

For these reasons, and in contrast to core networks, the cost of building an access network today is probably substantially higher than it was in the past. This is then reflected in the prices calculated using a LR(A)IC methodology.

Another important characteristic of the assets that make up an access network is that it is particularly difficult to estimate with sufficient precision their economic lifetimes. Accounting lifetimes of these assets have proved in the past to be considerably shorter than their useful economic lifetime. In part, this has happened because their useful life is difficult to estimate per se, as it depends on a number of uncertain factors. Since trenches, ducts, cables and other underground assets are not replaced very often, there is not much information and it is difficult to obtain precise estimates of their useful economic lifetime.

However, there is an additional factor that, in the case of access networks, is of particular importance. External technological developments made it possible for assets that were originally used only to supply a phone service to be used to supply different services (mainly internet connections) and thus an asset that was almost fully devalued became very valuable because of its new use.

This has two major implications for LR(A)IC models. The first is that it is particularly difficult to use the "correct" lifetime for underground assets when building a model and this could result in prices that do not reflect the appropriate lifetime of the assets and are therefore not correct. The second is that the cost calculated on the basis of a LR(A)IC model would compensate the incumbent for costs which have already been recovered: the depreciation charges of the original network would have already taken into account the cost incurred by the incumbent.

Thus access prices calculated on the basis of a LR(A)IC model would be high, since it would incorporate the cost of digging trenches, breaking the road pavement and resurfacing it, as well as the cost of labour. The estimated prices would be "correct" only if the lifetime of the assets used in the model corresponded to the actual lifetimes of these assets, which are difficult to estimate. Finally, the price would be calculated on the assumption that the assets of the access network are replaced, which is likely not to be the case. Recognising these and other shortcomings, the European Court of Justice has, in 2008, pointed out that access prices should not be based exclusively on LR(A)IC, and the same issue is under consideration in other parts of the world too; for example, the Australian Competition and Consumer Commission is currently hearing evidence on the matter.

What are the alternatives to LR(A)IC?

An alternative approach would be to recognise that the assets of the access network will not be replaced and calculate what would be the cost to society of maintaining the network in good working condition, so that it can continue to be used in the future. Therefore a different build/buy signal should be given to maximise the welfare of society. New infrastructure should be put in place if – and only if – the cost of doing so is lower than the cost of maintaining the current infrastructure in good working conditions (with the owner of the existing infrastructure being compensated for the investment it initially made). Therefore it would not be appropriate to calculate access prices on the basis of rebuilding the network at each regulatory review, as the LR(A)IC approach does.

Rather it should be assumed that an efficient new entrant would be able to use the existing infrastructure when calculating the appropriate access charges. At the same time, however, the costs included in the price should be forward-looking in that they should guarantee that the infrastructure is maintained and that the opportunity cost of the investment made by the owner of the assets is remunerated.

Thus a potential entrant would compare the cost of building its own network using the current technology (radio, fibre etc) with the cost of maintaining the existing infrastructure in good working condition, instead of with the cost of rebuilding the network from scratch with new technologies. This would clearly ensure that additional investment would be made only if it was more economical than using existing assets, thus reducing the risk of inefficiently duplicating existing infrastructure. It is likely that only a technology that is greatly superior to an existing one would be implemented, possibly resulting in products differentiated with respect to price and quality and offering more choice to consumers.

Therefore, rather than constructing a model that would calculate the costs of rebuilding a network from scratch, it would be necessary to estimate the (forward-looking) costs associated with maintaining the network in good working order, as well as the appropriate return on the investments made.

The second part of this exercise would not have any additional complication to current calculations made to estimate the cost of capital. On the other hand, the first part of this exercise should be considerably easier to carry out and subject to less controversy, given that only a subset of the costs currently used in LR(A)IC models would enter the calculations. As a first approximation, an average of the maintenance cost incurred by the incumbent operator over a reasonably large number of years, appropriately increased to take into account expected inflation, could be used to estimate future maintenance costs.

There is a successful precedent for this approach in the system of renewals accounting used in the England and Wales water industry and elsewhere. In the water industry in England and Wales, companies are required by the regulator to calculate an infrastructure renewals charge that estimates the annual amount necessary to maintain each company's network in good working order.

References

Arcor AG & Co KG v Bundesrepublik Deutschland, Judgment of the European Court of Justice, 24 April 2008

Europe Economics, Pricing Principles for the Unconditioned Local Loop Service (ULLS) in Australia - The Conceptual Framework, 2009