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I will abstract as much as possible from the complexity of the technology and the services in telecommunications to focus on the basic structure of the problem. The generic situation corresponding to the leased lines fits in the following diagram :

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There is a vertical organisation of the industry with at the upstream level the network infrastructure. This infrastructure is used by firms operating in the downstream segment to provide final services : voice telephony, data transmission, internet access, xDSL, private network and so on.

In this set-up two elements must be emphasized. First the providers of the infrastructure, telecommunication operators and backbones, are also active in the market for final services. Second providers of final services have the option to build their own network facilities as well as to lease existing lines.

The market is growing and there is a lot of investment going on. I shall take the view that there is already a competitive supply of long-distance infrastructure, or at least an on going process of increasing competition. In this context, the costs and distortions associated to an heavy public intervention in the long distance market probably offset the potential benefit. The emphasis should be put on the removal of remaining artificial barriers to entry, and thus the acceleration of the deregulation process.

Things are different in the local loop. Although one may envision an optimistic scenario where competition will eventually emerge, the current situation must be seen as one where there is still a bottleneck at the level of the access to the final consumers. This is a key issue in particular for the development of Internet in Europe. I shall thus be more concerned about this aspect of the problem.

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In a vertical industry, prices of the intermediate inputs play several roles. They affect the overall price level of the final services as well as the market structure for final services. And by signalling the shortages of supply and demand, they also affect the investment policies at all levels of the industry.

High prices result from the exercise of market power which is the main concern of the enquiry. They induce a low level of entry in the market for final services, and thus less competition and high prices for final services. This also limits the possibility for new comers of experimenting prior to making the final decision to build infrastructure.

At the opposite prices should not be too low.

If prices of leased lines are too low, incumbent operators will face a low return on investment and have poor incentives to upgrade their network or to extend their capacity to match the demand for leased lines. Even if one solves this problem by providing alternative incentives or constraints, a second problem emerges that can be seen as the other side of the coin.

With low prices of leased lines, new entrants also have poor incentives to develop their own infrastructures or to use alternative technologies. To give an example, if the resulting prices for highspeed access to internet on the local switched network are too low, cable operators may hesitate to undergo the required investment to provide cable access.

A second aspect of the problem, is that incumbents facing low rental charges for leased lines should naturally react by introducing non-prices barriers, such as delays, poor maintenance or a degradation of the quality of interconnection. Non-price barriers are extremely difficult to assess because of the complexity of the technologies involved. This requires a high level of expertise. Thus, insisting on low prices will require heavy handed regulation to control for quality, at the expense of flexibility.

The socially optimal level of prices must thus account for several conflicting effects and it is a delicate balance to find. Firms with market power will rarely account for these effects in an appropriate way.

Economic theory, however, tempers somewhat the alarmist view of the conflict between the exercise of market power and efficiency in the context that I described. The monopoly owner of an infrastructure will indeed account for these effects to some extent, since it is in its own interest to foster the development of the final services market which is the source of its revenues. In other words, it is useless to own a resource if no one wishes to use it.

The main concern comes from the fear that the owner of the infrastructure may foreclose the access to its facility. This is referred to in anti-trust as the essential facility doctrine.

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The doctrine addresses a situation where a monopoly owns an essential facility that is used by others companies along with complementary inputs to provide final goods or services. Examples of such facilities are the local loop, but also a bridge, a port, railroad stations or the grid for electricity....

Two conditions must be met :

First the facility must be essential, meaning that there is no alternative available at a reasonable cost (bypass of the facility is not economically viable).

The second condition is that the market for final services must be potentially competitive, so that the incumbent faces a competitive threat in this market.

The question is then whether the bottleneck owner has an interest in foreclosing the access to the facility to potential competitors.

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The traditional essential facility doctrine appeared in US anti-trust in 1912 when a consortium of 14 rail-road companies owning a gate on the Mississippi in Saint Louis denied access to their 10 competitors.

It states that : « The incumbent foreclose access to some users in an attempt to extend its monopoly power from the monopoly segment to the complementary segment. »

Practices that can be used for that purpose include foreclosure, excessive prices but also price-discrimination and the imposition of tie-in.

There has been a long controversy on this statement in the economic profession, which has been dominated by the Chicago critique. The critique lead by Bork and Posner argues that there is only one source of profit (as all revenues must eventually come from the sales of final services) and one monopoly power, so that it is meaningless to extend the monopoly power.

For example, if you own a bridge and someone else is more efficient than you at bringing trains on the other side of the river, it is more profitable to let him do it and tax the profits through an access fee rather than to provide the service yourself.

The critique does not say that there is no monopoly power and competitive pricing, but that there is no incentives to foreclose.

If economists are sceptical on the statement of the traditional essential facility doctrine, developments in the last 10 years have clarified the mechanisms that allow to put more substance in the conclusion : there may be exclusion.

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The mecanism at work is rather complex and I shall not try to describe it, but the new doctrines on essential facilities rely on the idea the competition for final services prevents the bottleneck owner from fully exploiting its market power.

The bottleneck has therefore an incentive to limit the access to its essential. With fewer participants on the market for final services, competition is reduced which allows the bottleneck to *restore* its monopoly power.

In other words the owner of a bridge will enjoy monopoly profit if it manages to be the *sole* provider of transportation *to final users*, while it may obtain little profit if there are *many* competing transportation companies.

The same logic applies to the local loop, with the potential for exclusion of some competitors and thus of a slowdown in the development of the market and less innovation.

The new theories thus provide solid grounds to build a case of essential facility and a guide for remedies to policy makers.

There is no easy solution to this problem. One may either regulate the access price or rely on anti-trust laws. Both have benefits and costs.

Imposing a ban on price-discrimination may not be a good solution in this context. It certainly eliminates strategies that target some firms for access and exclude others, but it also helps the monopoly owner to restore market power and raise prices.

Being established that there is a case for intervention, let me discuss briefly the level of prices that can be considered as reasonable. Although there are several ways to define it, the most commonly accepted view is oriented toward costs.

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Standard formulas for cost based prices include two main components. The first component is a measure of variable costs, the long run average incremental cost, while the second component accounts for the necessary financing of common costs, in which I include provisions for public service obligations.

The long run average incremental cost includes those costs that have to be incurred for providing the precise service (building and maintaining the line), taking as given the other existing infrastructures.

The long run perspective implies that we include in it the rate of return on the investment involved.

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This cost is extremely complex to evaluate in practice if not in theory. First the engineering aspects are complex due to heterogeneity both in equipments and in geographic conditions (such as population density).

Beyond this technical aspect, properly defined costs must be grounded in sound economic reasoning to avoid arbitrages and strategic behaviors.

An adequate « economic depreciation » rate must thus be applied, which requires to define the appropriate rate of return on capital.

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Keeping in mind that the main objective is the development of the infrastructure, this rate of return should reflect forward looking considerations as opposed to historical considerations, and be designed in such a way that it provides adequate incentives to develop the network.

Examples of elements that are difficult to account for are the following :

When the prices of equipment are falling and rental prices are cost oriented, investors anticipate the future downward pressure on rental prices, which may create delays in investment if not properly accounted for.

There is a high uncertainty on the future demand that an operator will face, which requires to include a risk premium in the measure.

There is also a high uncertainty on the technological progress. Technologies using the switched local network (xDSL) faces the risk of becoming obsolete, replaced by technologies using an alternative access (for example wireless, cable or the electric grid). This creates a risk of stranded asset that must be compensated.

(As a final comment, one must be keep in mind that the easiest way to favor a high quality of services is to allow for a reasonable high profit margin.)

Let me now turn to the other component.

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The price should include a mark-up that represents the contribution of entrants to the common cost of the incumbent. It is here because entry diverts some source of profit, leaving the burden of financing common costs to the remaining services provided by the incumbent. There is thus an opportunity cost of entry for the incumbent related to stranded assets.

The necessity to finance common costs and (if any) public service obligations is an important distortion as there is no perfect way to do this.

One point that emerges from the economic literature is that, as far as economic efficiency is concerned, the mark-up applied to various prices (being intermediate goods as leased lines or final services as voice telephony) should be adjusted to reflect demand conditions, and in particular the price sensitivity of demand which varies according to the service and the local demographic conditions.

The motivation for doing this is to avoid excluding low-demand users (the old mummy in a village) or reducing excessively the most elastic usage (such as internet access) by adjusting their prices downward, and compensating on other services.

While theory is clear on this point, there are several negative aspects that emerge when going from theory to practical implementation.

First, it requires a huge amount of information to be able to assess precisely demand conditions and to control for usage.

Second, using simple and cost oriented rules allows to use benchmarking and thus to compare the performance of several operators, which is useful both for regulation and for anti-trust enforcement.

The third point, but not least, is that, it may generate an intense lobbying activity as groups will organise to shape the process in their favour.

Price differentiation must thus be addressed with.

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To conclude, I shall summarize as follows :

So far as the long distance infrastructure is concerned, the energy should mostly be directed toward the removal of artificial barriers to entry.

Concerning the local loop, the conditions are still such that there is the scope of competitive abuse through excessive prices that exclude some players at the local level.

Finally, the rules that are used to assess whether prices are excessive or not must be forward looking, designed in such a way so as to encourage future investments and innovations.

There is a balance to be found between (low) prices that promote competition at the retail level, and (higher) prices that provide incentives to develop the infrastructure.