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Question 12/1: Tariff policies, tariff models and methods of determining the cost of national telecommunication services

STUDY GROUP 1

SOURCE: THOMSON-CSF (FRANCE)

TITLE: VALUATION OF THE RADIO-FREQUENCY SPECTRUM

1 Introduction

The radio spectrum is a limited global resource. It is in everyone's interest that it be used as rationally as possible. In the past, scant attention was given to the spectrum as a resource. In Europe, the frequency spectrum has acquired importance only in the past decade with technological development and the liberalization of telecommunications. The supply of new competing radiocommunication services results in greater use of frequencies, and in some countries needs are increasing more rapidly than the amount of available spectrum. In order to meet this demand, it has become imperative to make rational and optimal use of the spectrum.

Rational management is the precondition for establishing a spectrum policy that is in keeping with government priorities and the country's technological development. Optimizing spectrum management serves to secure more extensive (technical management) and more balanced (economic management) use of the spectrum.

2 Frequency sharing

Optimal technical management will involve the use of geographical separation of transmitting stations (geographical or spatial sharing) with an increasingly fine "granularity"; channelling in a frequency band (frequency reduction, adaptive systems); equipment (more directional antennas to reduce the risk of interference); or frequency reuse (cellular technology). All sharing possibilities should be sought and some are yet to be invented. This practice of frequency sharing is increasingly used in order to palliate the shortfall in available frequencies.

3 Valuation of the spectrum

Optimal economic management of the spectrum will make it possible to regulate demand, which must not preclude the extension of existing services while at the same time promoting innovation for the development of new radiocommunication systems. This can be achieved by seeking trade-offs for equal costs on the part of the various users, or in a more dynamic manner by applying rates that serve as an incentive to better use of the spectrum. One must be wary of forbidding access to the radio spectrum without good reasons, for intelligent use of the spectrum will bring not only material convenience but also jobs and income.

3.1 It is now becoming necessary to attach an economic value to the spectrum for a number of reasons:

- It encourages efficient use of this limited resource
- The revenue generated can be used to invest in an efficient management tool
- The revenue can also be used to finance the inevitable refarming that technological developments will necessitate

It is obvious that a usage fee proportional to the assigned bandwidth can but encourage the assignee to use that bandwidth as effectively as possible or to return part of it in order to pay less.

If, moreover, this fee is modulated as a function, for example, of the quantity of information transported per unit of frequency, the incentive is even greater.

The more congested the radio spectrum, the more difficult it is to manage, and the more efficient must be the tool used in its management.

The emergence of new technologies, or simply of new projects, that are of considerable interest to the end users and need frequencies in order to develop will doubtless increasingly call for spectrum refarming: it would be unfair for users who are obliged to "move" not to be compensated; indeed, they will be all the more willing to "move" if the compensation is fair in their eyes.

It may be tempting for certain states to take advantage of the revenue generated in order to enhance their financial situation; however it is patently preferable for the revenue to be used to cover, in the strictest possible sense, the spectrum management costs referred to above: overcharging spectrum users could only diminish their added value and, hence, the part they play in the nation's management, with a multiplier effect that would certainly militate against this solution.

3.2 The time has come to admit the principle that all users of the radio-frequency spectrum, without exception, must pay a usage fee.

However, it is evident that everyone must not (or cannot) pay the same price per Hertz: a distinction must be made between several categories of user, on the basis of the following criteria (non-exhaustive list):

- turnover generated thanks to the use of the spectrum or not;
- user's mission (public service, defence, research, ...);
- interest for the community;
- etc.

No-one should be exempted from paying their share, no matter how symbolic, and any part of the spectrum allowed to be used free of charge risks being immediately invaded and used inefficiently.

3.3 *The radio-frequency spectrum is a precious and "finite" natural resource and is therefore part of the national heritage, albeit intangible. It may not be transferred or sold, but only leased for a limited period.*

There are currently two ways in which spectrum is leased:

- by auction;
- at a fixed price.

The United States used lease by auction for PCS systems; given the importance of the stakes, the prices rose rapidly, but once they had acquired their frequencies some of the highest bidders found it impossible to cope with the investments needed to install the network. This form of lease renders spectrum sharing virtually impossible by definition, and should not be used as we are entering a period in which such sharing is becoming increasingly essential.

Fixed-price leasing can be done in two ways: the "first come, first served" method (the ITU norm), or by "beauty contest"; a mixture of the two would seem to be the sensible solution.

In order to enable the spectrum user to invest in the equipment necessary to make optimum use of the spectrum, a contract must be concluded setting the duration of the lease with due regard for the real or economic life of the equipment to be installed. When the lease runs out, the assigned (and leased) bandwidth returns in principle to the state. The lease contract may, however, be renegotiated at that time for the new lease period. The type of use and the lease price are redefined.

For instance, the state is released at the end of the lease from any removal costs, whereas it is obliged to compensate the user according to rules established in advance if it rescinds authorization to use the bandwidth before the end of the lease.

4 Conclusion

The following potential benefits can accrue from optimal management of the spectrum; for:

THE STATE

- Competitive economy through improved communications
- Creation of radiocommunication industries and services, as well as jobs
- Broader access to the benefits of technology
- Optimum revenue and charges for use of the spectrum
- Fulfilment of civil and defence security requirements

INDUSTRY AND OPERATORS

- Lower costs owing to the economy of scale in approval of the equipment
- Equitable and effective access to the spectrum and to new markets
- A stable investment climate

THE PUBLIC AND PROFESSIONALS

- Easy access to services and, in particular, to GMPCS at a reasonable price
 - Fulfilment of specific radiocommunication needs, such as transport safety and infrastructure management
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