



Anti-competitive behaviour in spectrum markets: Analysis and response

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ABSTRACT

The introduction of spectrum trading creates opportunities for operators, singly or jointly, to foreclose entry into downstream markets by accumulating unneeded spectrum holdings. After considering how these issues are treated under administrative methods of spectrum management, the paper examines the degree of substitutability of frequencies with or without regulatory constraints, concluding that the latter are a major source of limitations on substitutability. This may create a case for intervention in the transition to a spectrum market. Alternative forms of intervention are considered, including caps on spectrum holdings or on the acquisition of spectrum at any award.

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1. Introduction

Maximising the opportunities for spectrum—using industries requires that spectrum be fully used rather than hoarded, and that no firm is able to use market power in spectrum licences to foreclose or limit competition in end-user markets. The development in recent years of the use of market methods, permitting change of use and secondary trading, to allocate and assign spectrum in place of more traditional administrative methods, has focussed attention on the risks of anti-competitive conduct in the newly created spectrum markets.

This paper provides an overview of the risks. It first describes how traditional administrative approaches to spectrum have dealt with the problems of hoarding and barriers to entry associated with spectrum management (Section 2). Section 3 then looks at the degree to which first access to spectrum in general and then access to particular frequencies is indispensable for the provision of particular services in downstream end-user markets. The activities addressed in the paper produce electronic communications services, including mobile and wireless voice and data services (to which most of the analysis is directed), fixed links, broadcast transmission and satellite services.¹ The focus in Section 3 is on technical possibilities—what technologies or which radio frequencies are realistically capable, according to the laws of physics and economics, of producing the services in question. The further and considerable impact of regulatory restrictions, made by human intervention, is considered in Section 4.

The general conclusion from this analysis is that the opportunities for the strategic creation of barriers to entry via spectrum markets are likely to derive not so much from spectrum markets themselves, but (as is often the case in other contexts) from regulatory restrictions on the operation of the market-place, particularly restrictions on changes of spectrum use, which Balkanise markets and permit one or—more frequently—a small number of firms to restrict entry into downstream services. This reflects the general proposition that markets are an increasing returns to scale allocation mechanism—the more agents and goods and services are involved, the better they work and the more competitive they

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¹ The same analysis could be applied to other services such as radar, but this is not attempted here.

are. This suggests that if many of the above-noted regulatory restrictions are transitory, once their legacy has been eliminated the problem of anti-competitive conduct may diminish.

Where competition problems do arise, a number of interventions are possible. Section 4 considers the options, including subjecting trades to scrutiny on competition grounds before they are accomplished, explicit restrictions on hoarding (including ‘use it or lose it’ rules), and spectrum caps, including caps on the stock of frequencies any firm can hold or on the amount any firm can acquire in the course of a new award. Section 5 contains a summary and conclusion.

2. Spectrum hoarding under the ancien régime

Under a spectrum management regime implemented by administrative methods, frequencies are assigned via licences, which typically specify what services are to be produced, with what technology, using which apparatus located where and operating at what power level. Provided the interference model used to drive the location and power of the apparatus is sufficiently accurate, this method has proved very effective in controlling interference, though minor adjustments may be needed to resolve local problems.

Under this regime, spectrum is allocated when the spectrum regulator is persuaded that there is a need for the relevant service. The method of licence assignment may be first come, first served, a comparative hearing or ‘beauty contest,’ or an auction. ‘First come, first served’ is the spectrum assignment method most frequently used by national regulators and implies that spectrum is assigned in order of receipt of applications, provided the application criteria are met. Comparative hearings are used when a limited quantity of spectrum is available and a number of competing applications are expected (e.g., for broadcasting or public mobile systems); applicants usually submit proposals covering criteria established by spectrum authorities (proposals would typically include information on population coverage, service quality, and speed of implementation). With an auction, applicants are invited to submit cash bids, usually in addition to meeting regulatory requirements; compared with other assignment methods, auctions can be more transparent, objective and cheaper to administer, but auction design is crucial to avoid undesired outcomes (e.g. the creation of a bidding ring among applicants).

The licensee is usually charged an administrative fee, based upon the costs of planning the allocation table, issuing licences and ensuring compliance with licence conditions; administrations may set fees based on a flat rate or variable fees (according to quantity of spectrum occupied, and frequency band used). The duration of licences varies from country to country and from frequency to frequency. Licences issued before the era of auctions and spectrum scarcity were often of short duration, for example annual, but with a legitimate expectation, sometimes enforceable through a court, of renewal (with or without fee payment) or at least of a substantial period of notice. Licences acquired at auction often last for a substantial initial period, designed to be capable of repaying the cost of the licence and of collateral investments, sometimes with provision for renewal for further periods. For example, in the US auctioned licences are effectively perpetual; in Australia spectrum licences usually last for 15 years and apparatus licences for 5 years (a recommendation in 2002 by the Australian Productivity Commission in favour of issuing spectrum licences in perpetuity was not implemented by the government); in Guatemala licences have a duration of 15 years and are renewable for a further two periods; in Norway licences have traditionally a fixed duration—but an extension to 15–20 years is under consideration; and so on. Arrangements for assigning spectrum to public sector users often operate in a broadly similar fashion, but with less explicitness and transparency.

Within this system, recovery and change of use of frequencies (refarming) is traditionally achieved by giving substantial notice that a spectrum licence will be terminated, and sometimes—where demand for the end user service will continue—by providing a new frequency and funding the licensee’s move to that frequency. There are again differences from country to country in the right held by the spectrum regulator to revoke the licence.

If hoarding is loosely defined as acquiring or retaining frequencies with a zero or low expectation of efficient use, what incentives are there to hoard under an administrative spectrum management regime? The broad answer is that they are pervasive. Holding ‘superior’ spectrum carries little cost, as administrative charges tend to be low (at least compared with the opportunity cost of the spectrum). The practice of auditing spectrum use is a relatively recent one, which has not spread widely, so that information about the level of spectrum use is confined, at best,² to a licensee which itself has little reason to inquire into use levels in non-congested frequencies. This limits the application of moral pressure to return unused frequencies, although there are examples of it in the public sector.

Where commercial communications activities are concerned, strategic or anti-competitive motives for hoarding may be in play. This refers to the strategic use of spectrum licences to hamper the development of competition or competitors. This might include denying rivals or new entrants access to spectrum or raising its cost to them. Note that this definition is broader than the category of behaviour which breaches competition law, as it captures any conduct by which a firm reduces its own profits—for example by paying the administrative charge for unused spectrum—in order to injure a competitor. It may be taken by one firm or more likely by several firms acting on the basis of an explicit or tacit agreement. Since mobile markets can usually be described as natural oligopolies, such joint behaviour is more of a risk than a standard monopolistic abuse.

² It is not uncommon for audits to discover that the licensee is as much in the dark as anyone else about the extent of use, or even the precise application, of its own spectrum.

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