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Is allowing trading enough? Making secondary markets in spectrum work ☆

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ABSTRACT

The debate on spectrum reforms has mostly focused on the choice between a property rights and a commons regime. This article argues that moving to a property right system requires careful attention to details in order to avoid that "micro" rather than "macro" factors may prevent efficient trades from taking place. It provides a framework to conduct this assessment, identifies a number of possible concerns and puts forward some solutions.

1. Introduction

In the last decade spectrum management has been radically reformed and a few countries moved away from the heavy-handed "command and control" approach to rely on market forces. The debate in this area has been intense and has focused on the two main alternatives that rely either on the introduction of private property rights that guarantee exclusive use by the licensee or open access or unlicensed models such that often applied to fish stocks or open land (also known as "commons").

While the debate over these alternatives and other proposed hybrid solutions is important, this article addresses a different and narrower question. It accepts as a starting point a system largely based on exclusive property rights which is the position adopted by most regulators that have introduced spectrum reforms (at least in frequencies where scarcity is likely to be an issue). In such a system any benefits from reform can only come about if it allows initial misallocations to be corrected or future changes in demand and supply to be accommodated by trading (and changes of use).[1] Therefore, it is critical that secondary markets do not prevent efficient transactions and conversely do not encourage or allow inefficient transactions. In other words, this article focuses on the "micro" aspects of setting up secondary markets in spectrum. It

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[1] Terminology differs across countries. Trading refers to change in ownership of a licence and generally means that licensees are allowed to further aggregate and disaggregate their spectrum endowments (either geographically, by frequency or time). The term change of use refers to the ability to modify the service that makes use of spectrum as an input. This is known as liberalisation in the UK but in many other countries it is simply referred to as licence variation. In the UK some licences have been made tradable and liberalised but formally other aspects of the property rights remain the same—i.e. they prescribe in detail which technology to use, which sites etc. This means that a license variation would be needed if the licensee wished to modify any licence feature. In other countries, such as Australia and New Zealand, the definition property rights has been simplified and defined in terms of the maximum level of interference that licencees can impose on neighbouring licensees. As long as such level is not exceeded, the licensee is free to use the spectrum in whichever way it wishes. A licence variation would only be required if the licensee wished to use its spectrum for an application that would exceed the set levels of interference.

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recognises, however, that "macro" aspects, such as the amount of spectrum that is made tradable and allowing government agencies with "rights" to substantial amounts of spectrum to participate in the market would also be important.

This article provides a simple framework to categorise and assess possible "micro" impediments to efficient trades (or changes of use) and discusses specific factors that may act as an impediment to trade based on a comparison of spectrum trading regimes in a number of countries.[2] It also discusses and assesses practical options to remedy the concerns identified. While this article refers mainly to trading, most of the comments equally apply to changes of use.

2. Property rights vs. commons

The consensus among economists is that market-based mechanisms are to be preferred to "command and control" approaches in managing spectrum for a number of reasons not fully covered here, see Ofcom (2005a), Cave (2002) and Valletti (2001) for a discussion. The "command and control" approach to spectrum management has become increasingly inefficient as demand for spectrum continues to grow and new possible uses of spectrum proliferate, leading to scarcity and inefficient allocations. A "command and control" approach cannot ensure that spectrum is efficiently and timely allocated to those uses that generate most benefits or welfare to society because the regulation has neither the information nor the incentives to make such choices promptly. It is usually accepted that to make such complex allocation choices a decentralised market system works better than any central planner.

The largest majority of economists believes that a system based on well-defined exclusive property rights is, under most circumstances, to be preferred to a system based on the "commons" approach, especially in presence of scarcity.[3] It is, however, accepted that when scarcity is unlikely to be a problem and transaction costs are high some form of unlicensed use or "commons" may be appropriate (Faulhaber & Farber, 2003). While the debate has often been portrayed as a clash of two opposing views, in practice, there are examples where a compromise solution has been chosen. Indeed, this has led a number of economists to take intermediate positions where the two approaches can coexist (Baumol & Robyn, 2006; Cave, Doyle, & Webb, 2007).

3. A framework for identifying impediments to efficient trading

The focus of this article is to assess under which conditions secondary markets in spectrum work as efficiently as possible—i.e. generate the largest total welfare in the long run. The goal is not to attain a status where secondary spectrum markets operate perfectly. Indeed, the available evidence suggests that spectrum markets will be relatively thin with limited turnover of licences. The aim is to remove any unnecessary restrictions that may hamper increasing efficiency as long as the cost of removing them or implementing reforms does not outweigh its benefits. Furthermore, as discussed below, the fact that spectrum secondary markets are likely to be "thin" means that there are potential high incremental benefits from relatively small improvements in efficiency.

3.1. Features of an efficient market

Efficient markets are those that generate the largest total welfare for consumers and producers and where trades (or changes in use) that increase social welfare should not be impeded and, conversely, those that do not should be prevented. All features of efficient spectrum markets could be reconciled with the concepts of market and regulatory failure. Indeed, all the assumptions under which the first welfare theorem holds describe a market where there is no market failure. In addition to the presence of conventional market failures regulatory failure is potentially particularly relevant for spectrum. Regulatory intervention in spectrum has historically been particularly intense and, despite the recent trend, there remains a significant regulatory oversight over, or intervention in, the market. Significant portions of spectrum are not yet tradable (spectrum held by government agencies and/or used to provide broadcasting services etc.) and regulators in part control the supply of spectrum into the market through primary awards.

3.2. When trades occur

Given an initial allocation of the existing finite spectrum resources to a number of exclusive users, trades occur if an entrant (or another incumbent) values an existing portion of spectrum more than the incumbent user and if the difference between the two is larger than the transaction costs. This may involve the entrant providing the same service as the incumbent or changing the use of spectrum to provide a different service. It may also involve the incumbent changing the service it currently supplies (this would not be a trade but a change of use).

[2] The information about the regulatory regimes and the experience in various countries is largely based on information in Indepen (2007).

[3] See for example De Vany (1998) and Lenard et al. (2006). Faulhaber (2005, p. 6) argues that the supporters of a "commons" solution come from "*a group of technologists and legal scholars*". Examples, among many, include Werbach (2002) and Benkler (1998).