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Liberty and harmony?

THE PROS AND CONS OF COMMON STANDARDS FOR USAGE OF RADIO SPECTRUM

Since 2002, the European Union has been using new powers to step up the harmonisation of spectrum use across member countries. In a number of these countries, however, the development of liberalisation policies has raised expectations that market-based methods of allocating and assigning spectrum will play an increasingly important role. This bulletin explores the tensions between these two objectives.

International spectrum harmonisation involves the common designation of frequency bands for particular services in different countries, or a common approach to band-sharing in different countries. Under the Radio Service Directive (2002), the European Union (EU) has increased powers to pursue harmonisation by administrative means. The result is a network of international legal obligations that may deliver harmonisation, but this may be at a price in terms of market efficiency.

Would it be better to leave the degree of harmonisation to the market? And to what extent is it now possible to do so? Economics provides a framework within which these →

questions can be debated, and can help policy-makers and spectrum users understand the costs and benefits of different approaches.

WHY HARMONISE?

In certain aeronautical and maritime services the use of common frequencies worldwide is an essential operational requirement. Even where it is not essential, harmonisation may increase efficiency wherever there is a significant level of cross-border activity – in broadcasting and satellite services, for example.

More generally, harmonisation may promote economic efficiency by facilitating the development of common technical standards and an international market for equipment and services enabling manufacturers to take advantage of economies of scale.

Harmonisation can also facilitate international interoperability – allowing consumers to make use of the same radio equipment in different countries. This is clearly most relevant when users are internationally mobile – as is the case for mobile phone roaming, for example.

...AND WHY NOT?

Spectrum harmonisation can also give rise to what economists refer to as an “opportunity cost”. Essentially, this is because frequency harmonisation constrains spectrum usage internationally; so it takes place at the cost of limiting the market’s ability to match demand and supply at a national level.

This will matter most when spectrum is scarce, and when the nature of supply and demand for spectrum varies between countries. In these circumstances, harmonisation may mean that in some countries, there is excess demand for spectrum in a particular band; while in others, there is unused spectrum.

Other costs associated with harmonisation include the risk that a loss of flexibility in spectrum allocation will inhibit innovation, and the danger that delays in implementing such administrative policies will raise costs and inhibit investment.

The balance of pros and cons will depend on the technical and market characteristics now and in the future. Assessing this brings with it the risk of misforecasting a complex set of economic and technical interactions.

It was for that reason that the Review of Radio Spectrum Management, Professor Martin Cave’s March 2002 report to the UK government, recommended that harmonisation measures should be time-limited and subject to periodic review. In its Spectrum Framework Review, a consultation paper published in November 2004, the UK telecoms regulator, Ofcom, proposed this and a number of other measures designed to make harmonisation more flexible and dynamic.

HOW THE EU IS REGULATED

In 2002, the EU adopted the Radio Spectrum Decision (RSD), in order to strengthen the powers of the European Commission (EC) to harmonise spectrum. The RSD provides that the EC can adopt legally-binding decisions to harmonise frequency bands within the EU for applications where there is a strong requirement for pan-European harmonisation.

The Commission issues mandates to CEPT (the Conference of European Postal and Telecommunication Administrators) to develop harmonised technical solutions for specific applications. A number of such mandates have been issued since the RSD came into force such as re-use of the underused ERMES¹ band and the re-use of Terrestrial Flight Telephone System bands. The Commission also recently adopted a Decision to harmonise 24GHz spectrum for the use of automotive short-range radar equipment².

WHAT'S LEFT TO LIBERALISE?

The practical effect of EU harmonisation policies is that there are certain bands where spectrum liberalisation cannot be fully applied. Ofcom has indicated that these may include bands already harmonised by the EC which are already subject to a number of European harmonisation measures³, maritime and aviation bands and spectrum for satellite services.

That still leaves such bands as business radio, fixed wireless access and fixed links where it may be possible to leave it to the market to determine the efficient degree of harmonisation. For this to work, spectrum markets must exist throughout all, or at least a significant part, of the EU.

Assuming this to be the case, then one might envisage the following approach to market-driven harmonisation in future.

- First, manufacturers and operators might develop a new equipment standard, for example within ETSI (the European Telecommunications Standards Institute), and propose a harmonised frequency band for this.
- The CEPT might then undertake an assessment of the extent to which the proposed new service would interfere with existing spectrum users.
- Assuming that the CEPT gave the proposed use a clean bill of health, then national spectrum managers would need to ensure that spectrum rights were available in the relevant band, and that these were sufficiently flexible to accommodate the proposed new use.
- The way would then, in theory, be clear for spectrum users to acquire rights in different countries in order to achieve the desired degree of harmonisation.

The key advantage of market-driven harmonisation is that it will only occur if the benefits of harmonisation outweigh the costs. This is because those users who wish to harmonise a band must compete with other possible users, and in particular must be prepared to pay more for the spectrum.

Moreover, if the expected benefits of harmonisation do not emerge, or a more valuable alternative use for a harmonised band subsequently develops, spectrum liberalisation would provide a mechanism for reallocating spectrum in a flexible and timely manner.

However, there are also circumstances in which market mechanisms do not work well. In the case of spectrum harmonisation, the following are potential sources of such "market failure".

- The "chicken and egg problem", stemming from operators' failure to co-ordinate properly because of uncertainty about future spectrum use. It is not clear how serious this problem might be in practice, since if the benefits of harmonisation were sufficiently large, one could expect one or more manufacturers or operators to take the lead.
- The "hold-up problem", taking the form of a spectrum user who has a strategic holding in the centre of a band that is required for harmonisation and who may attempt to extract a monopoly price for this. It may be possible to deal with this problem through the application of competition law.
- The "externalities problem", wider social benefits (or potentially costs) from harmonisation that are not fully taken into account by spectrum users. These problems may be dealt with by the application of other, complementary government policies rather than administrative intervention.

Liberty and harmony?

Each of these market failures can, in theory, be overcome. However, if they turn out to be significant, then it is possible that they can prevent market-driven harmonisation occurring or delivering the hoped-for benefits.

In such cases, regulatory intervention could remain as a back-stop.

ON OUR WAY?

Spectrum trading and liberalisation are still in their infancy in Europe, and it is likely that spectrum markets will develop slowly and also at different rates across the EU. One possible scenario is that a small number of Member States (including the UK) begin to liberalise certain spectrum bands, while others continue to rely on the established administrative allocation methods.

In this scenario, harmonisation initiatives will probably still be regulatory rather than market-driven, which in turn would constrain liberalisation in the “market” group. A second possibility is that the UK alone liberalises, and that this results in a reduction in the existing level of harmonisation between the UK and other Member States. However, for this to happen, EU harmonisation obligations would have to allow for a change of use.

Looking farther ahead, there is at least the possibility that spectrum is liberalised in a significant number of Member States. We might see market-driven harmonisation in some bands emerging on a regional basis; and this might even drive wider harmonisation throughout the EU.

CONCLUSION

While international spectrum harmonisation may have important benefits, these may be outweighed by the costs associated with a loss of flexibility in spectrum allocation, particularly if the anticipated demand for a harmonised service does not emerge as expected. In principle, market-driven harmonisation is preferable, since it should ensure that spectrum is harmonised only when there is a net benefit.

Widespread liberalisation remains some way off, and so harmonisation will continue to be driven by regulation for the foreseeable future; and this in turn will constrain liberalisation even in those countries that desire it. But looking further ahead, it is possible to see some potential for market-driven harmonisation to occur, in some bands, on a regional basis, and create the momentum for greater change. In the meantime, therefore, it is important to ensure that administrative harmonisation is carried out in a way that is flexible and subject to revocation, as technologies and markets change.

SOURCE	<ol style="list-style-type: none"> 1. <i>The European Radio Messaging System (ERMES) is a paging system specification, used primarily in Europe.</i> 2. <i>Technology fitted to vehicles in order to detect possible collisions, and hence improve road safety.</i> 3. <i>Including European Radio Communications Committee decisions and the GSM directive (87/372/EEC).</i>
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