

National Academy of Science
Washington DC

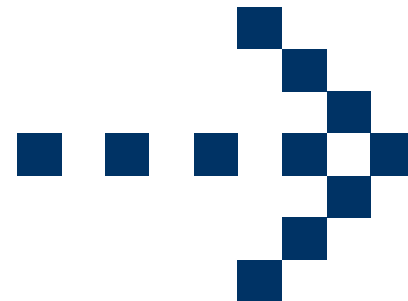
Improving spectrum management through economic
or other incentives

February 28 – March 1 2006

‘Fee-based and other mechanisms’



Martin Cave
Warwick Business School
University of Warwick, UK
Martin.Cave@wbs.ac.uk



Packaging spectrum reform

Traditional view:

commercial users – the market

public sector users – command and control,
plus administered prices

Current UK policy:

The market, almost everywhere

plus

administered pricing for

- legacy privacy sector licensees
- irreducible public sector demand

How the UK sets administered incentive prices (AIP)

- ▣ Proxy opportunity cost, defined as cost saving vs. next best use, not market price – ie. scarcity rent not monopoly rents
- ▣ Ramp up prices gradually
- ▣ Extend coverage to more frequencies
- ▣ ‘Improve’ prices using more margins of substitution

AIP In practice in 1998

- ❑ The RA calculated opportunity costs based on the marginal value (least-cost-alternative) and generally halved the values obtained
- ❑ The RA applies:
 - ❑ (Low) fixed Link values to spectrum above 2GHz
 - ❑ (High) mobile values to spectrum below 2GHz

Generalising the original method

- ⌘ Continue to work with opportunity cost principle
- ⌘ Extend it to account for:
 - ⌘ inter-relationships between different uses and frequency bands
 - ⌘ heterogeneity of users within frequency band
- ⌘ This requires the regulate to
 - ⌘ Identify where spectrum is substitutable across uses; and
 - ⌘ Populate a matrix with estimated opportunity costs using the least-cost alternative method

The new process

1. Identify current and other uses in each frequency band
2. Estimate the opportunity costs associated with each use
3. If there exist one or more opportunity costs for a use(s) in a frequency band that is (are) greater than the opportunity cost for the current use:

The price for the frequency band should lie between the opportunity cost of the current use and the highest observed opportunity cost for an alternative use

4. If there does not exist any other higher opportunity cost than the current use:

The price of the frequency band should be equal to the opportunity cost for the current use (based on an estimate of the average user in the frequency band)

5. In choosing AIP within an interval, efficiency is promoted by setting AIP 'close' to the lowest value in an interval

Current scope of AIP

Current	£m
2G mobile operators	69
Ministry of Defence	55
Fixed links	19
Private & Public Business Radio	9
Emergency Services	3
Remainder	11

Proposed extensions (Independent Audit 2005)

- ☐☐☐ Ministry of Defence Radar
- ☐☐☐ Defence NATO Spectrum
- ☐☐☐ Ground-based Aeronautical Radar

Interaction with Public Sector Incentive

- ❑ AIP must not become a ‘money-go-round’
- ❑ UK public expenditure operates on 3-yearly Comprehensive Spending Review, which sets out targets and resources
- ❑ Public sector users’ budgets will embody ‘normative’ spectrum charges (and spectrum sale proceeds)
- ❑ This will provide medium-term incentives

What if it doesn't work?

UK Ministry of Defence has handed spectrum back before AIP and after

No systematic evidence of role of pricing

General lack of public sector expertise in planning/contracting spectrum

Possible next steps:

- severer challenge
- quantitative (command and control) targets for savings