

How to take account of social value in spectrum awards

Tuesday 15 December
10:00-12:00

Under Chatham House Rule

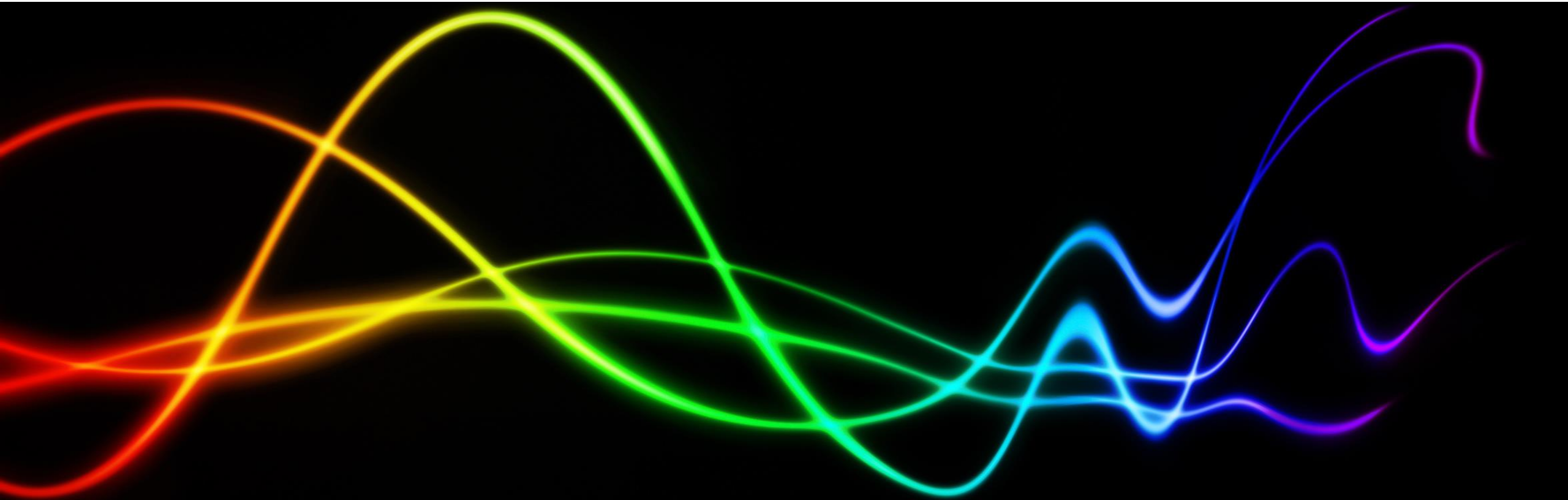
Agenda

- (Chair) Tony Lavender, Chair of Cluster 3 and Plum Consulting
- Tim Miller, Plum Consulting
- Abhaya Sumanasena, Real Wireless

Introductions

Tony Lavender

uk spectrum policy forum



Introduction

- The Government's Spectrum Strategy (2014) established an Expert Panel to look at incorporating social value into spectrum allocation decisions
- The terms of reference of the Panel were:
 - To advise on options for evaluating the social value of spectrum which can be deployed alongside the evaluation of economic value
 - To consider how these options may or may not be consistent with the Government's valuation principles
 - To consider how these options might be applied to future decisions on the change of use of spectrum
 - To deliver a draft report outlining options and a proposed approach for evaluating the social value of spectrum, that can be finalised and delivered to Ministers by 15 May 2015

Expert panel output

- The following points were raised in the output of the Expert Panel:
 - The importance of framing the problem well (a “triage” stage)
 - Setting things out in everyday language
 - Use a mix of methods to establish what social value might be (in addition to private value)
 - Integrate results of monetary and other analysis but do not try to come to a single monetary figure
 - Recommendations including options and trade offs

A systematic
framework

Show the scale of the
decision

Think about how the
public sees issues
and trade offs

Show how different
judgments about
economic and social
issues would lead to
different spectrum
allocations

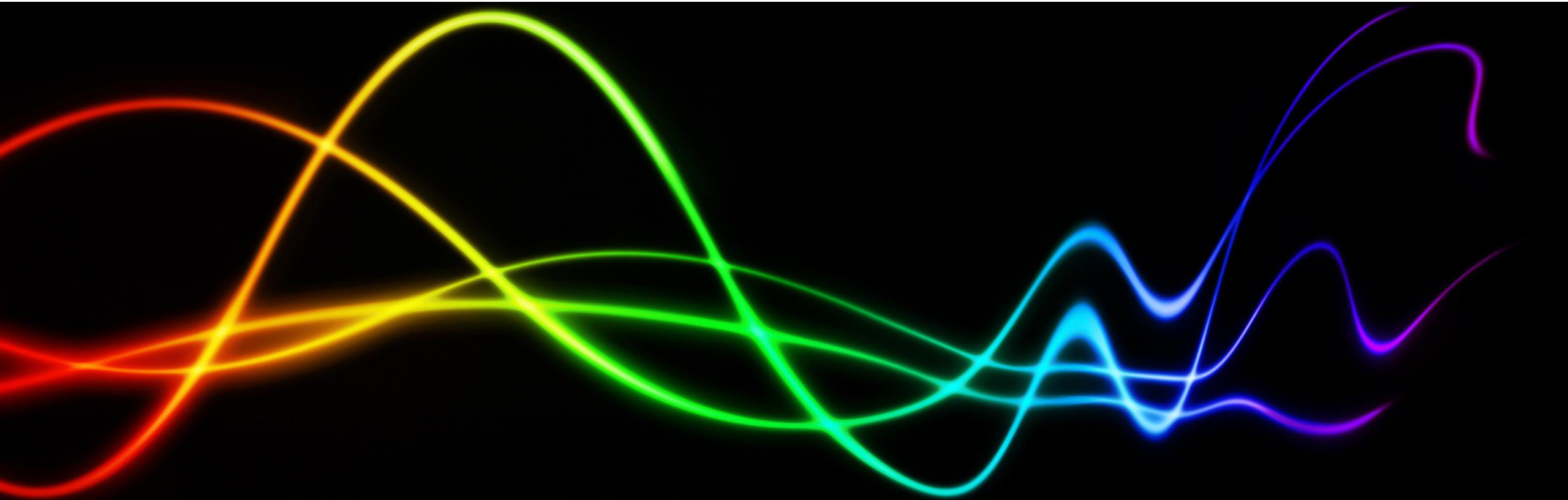
Moving forward to 2020

- Not clear that outstanding questions from the 2015 study have been answered or that there is yet a single consistent way of valuing spectrum
- Back to the question of how to take account of social value in spectrum awards?
- Becoming increasingly relevant with new spectrum users and changing modes of use of spectrum (including but not limited to 5G)
- Recent events will be driving toward obtaining the most economically and socially efficient outcomes for access to scarce resources – there is a strong technical efficiency imperative too

An introduction to externalities and social value

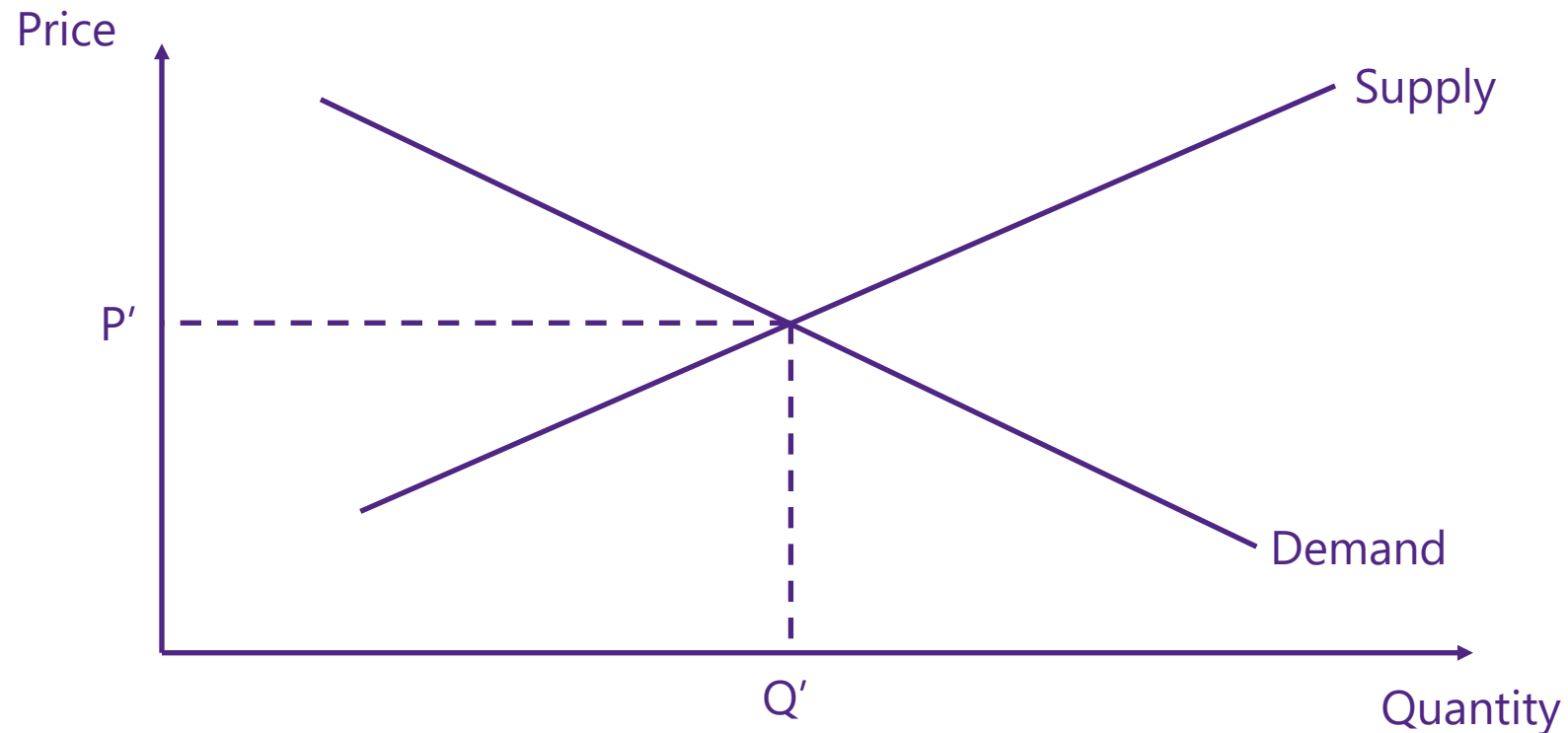
Tim Miller

uk spectrum policy forum



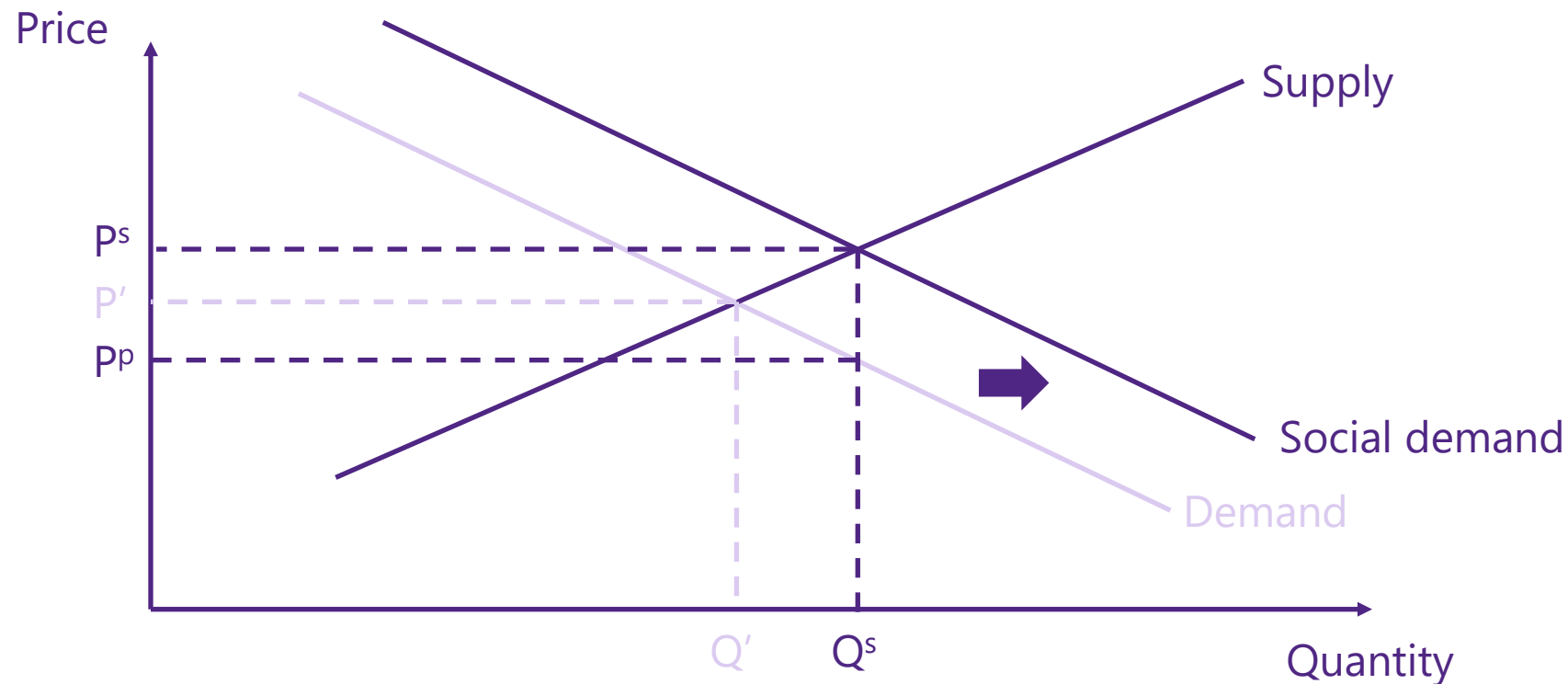
Market demand and supply meets at an equilibrium

- Operators supply services at a price level set by the market
- Spectrum is acquired to satisfy this demand



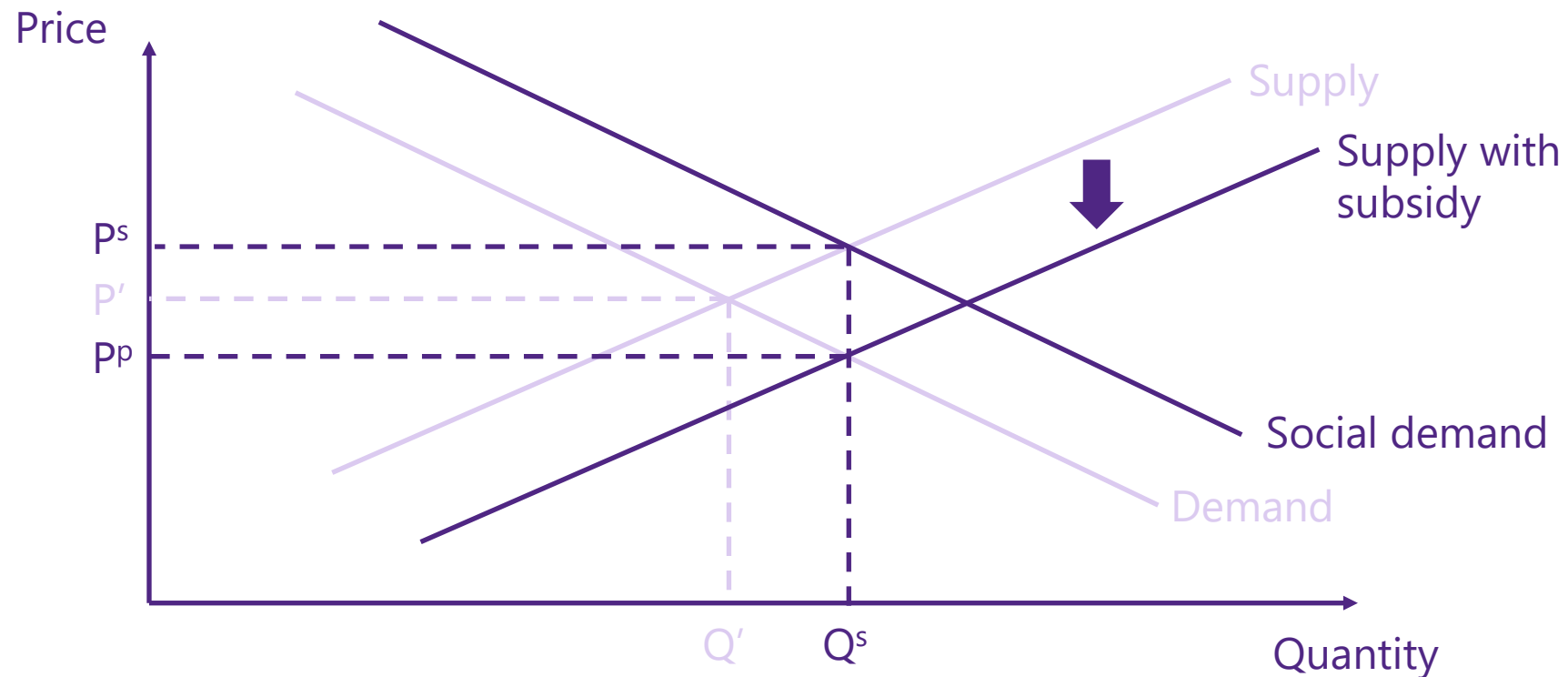
Social value represents an externality which would otherwise be lost

- A disconnect exists where private individuals pay but society benefits

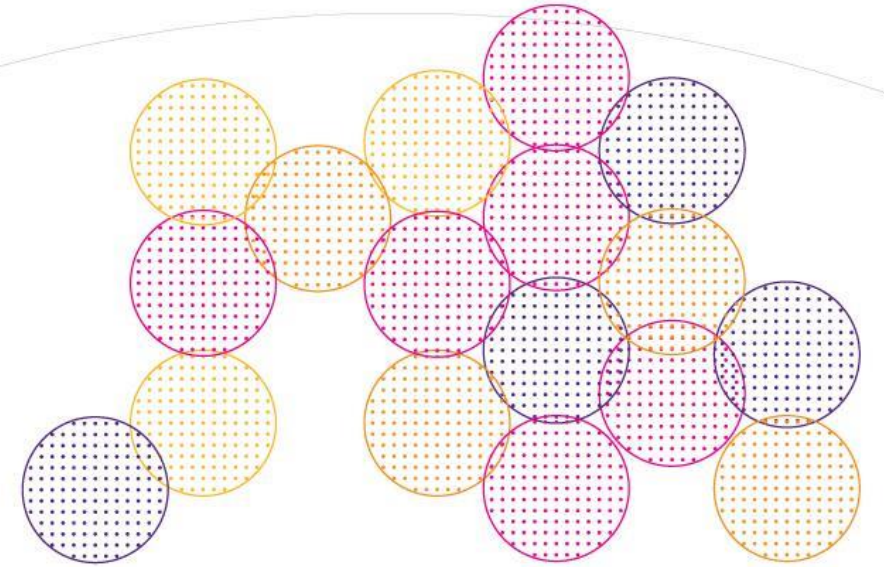


Government intervention is needed to internalise the externality

- Classical remedies include subsidies or grants



The impact on spectrum awards



Regulators tend to aim at optimising value to consumers and society

Spectrum awards

Ofcom has a duty to secure the optimal use of the radio spectrum; this is to [release available spectrum](#) for use by the public.

Ofcom's principal duty, in carrying out its functions, is to secure the optimal use of the radio spectrum for the benefit of citizens in relation to communications matters. Where appropriate by promoting competition, this is to secure the optimal use for wireless telegraphy. This is of particular relevance when carrying out our spectrum functions.

215. As the *Spectrum Policy Task Force Report* noted, the overarching goal of spectrum policy is to maximize the public benefits that are derived from spectrum-based services and devices.⁴⁰³ In accordance with our statutory obligations, the Commission has balanced multiple competing objectives in the award of initial, mutually exclusive spectrum licenses through competitive bidding, including:

- the development and rapid deployment of new technologies, products, and services for the benefit of the public, including those residing in rural areas, without administrative or judicial delays;
- promoting economic opportunity and competition and ensuring that new and innovative technologies are readily accessible to the American people by avoiding excessive concentration of licenses and by disseminating licenses among a wide variety of applicants, including small businesses, rural telephone companies, and businesses owned by members of minority groups and women;
- recovery for the public of a portion of the value of the public spectrum resource made available for commercial use and avoidance of unjust enrichment through the methods employed to award uses of that resource; and
- efficient and intensive use of the electromagnetic spectrum.⁴⁰⁴

can be found in Appendix 1.

In accordance with a request made by the ministers and Parliament during recent parliamentary debates (on a bill on growth and business, a bill on the second digital dividend and ongoing upgrades to digital terrestrial television, and on the work being done by the High Commission for public postal and electronic communications services (*Commission supérieure du service public des postes et des communications électroniques*), the procedure takes utmost account of **digital regional development** priorities.

4. Ofcom proposes the following main objectives of the award at §1.3

- improving mobile coverage;

efficient allocation of spectrum;

strong competition in mobile markets; and

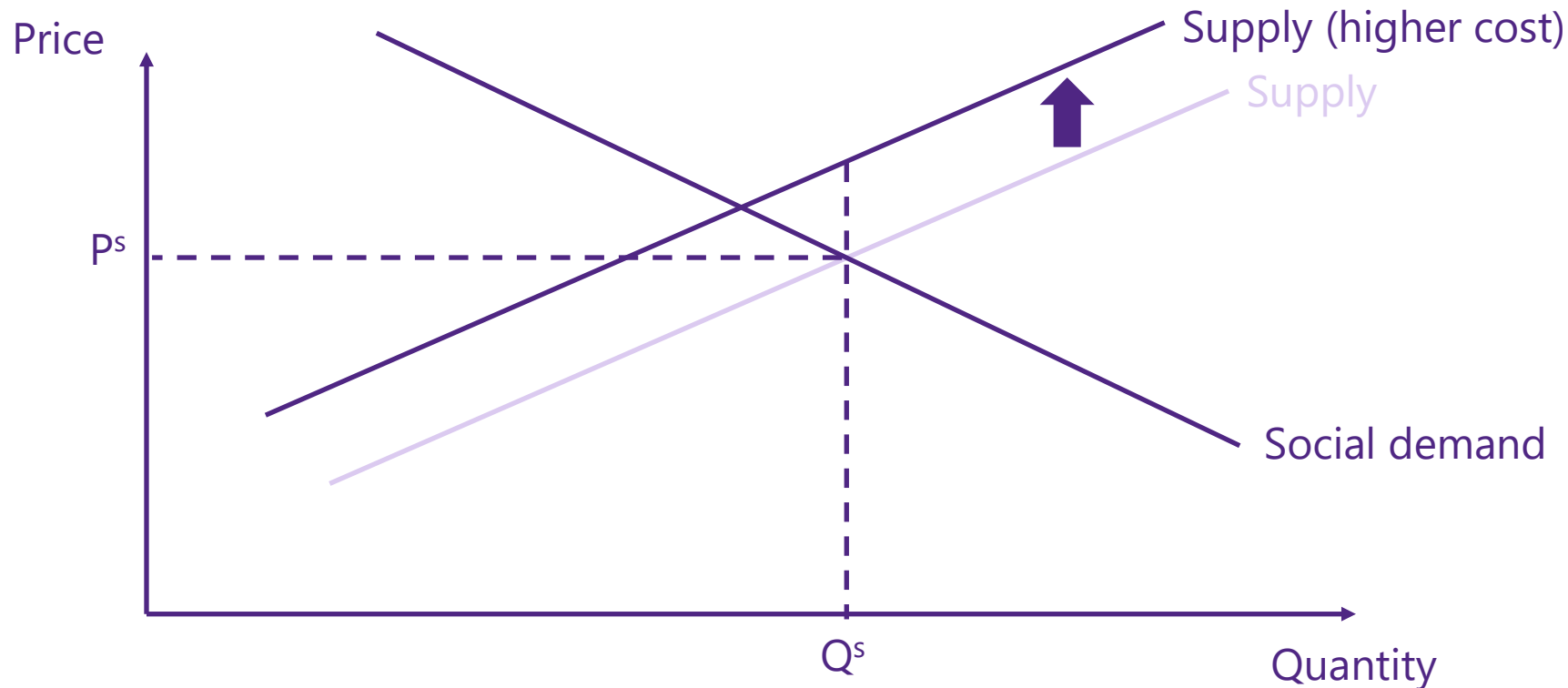
the timely availability of spectrum.

in terms of monetising intangible State assets, active competition.

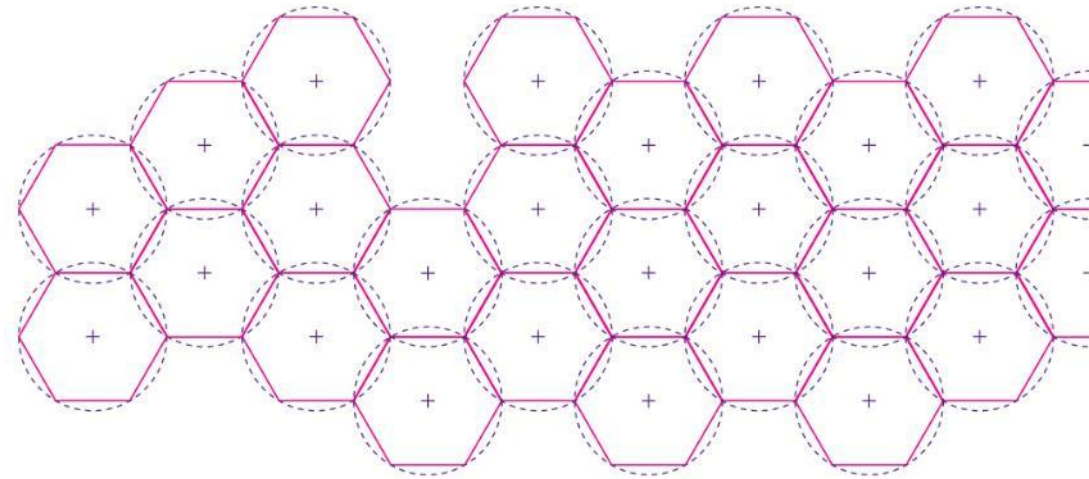
worked with the ministers to establish a procedure will begin with a reserve price, set by the ministers, entire band. A detailed description of the procedure

Rather than reducing costs, regulators tend to impose obligations

- Meeting obligations costs operators – shifting supply curve up – but quantity is forced to stay constant
- Supply curve **must** shift back down by reducing input costs (including the price paid for spectrum)



Accounting for social value in spectrum valuation



How can regulators know how to set an appropriate subsidy?

- Market forces can be used to set efficient outcomes if adjustments are made
- Defining quantity or other quality parameters will adjust spectrum value
 - Requirements on operators to calculate impacts
 - Market prices will reflect effective subsidisation
- What is the socially optimum quantity (and how should this be distributed)?
- What is the socially optimum quality?
- How will spectrum value be affected?

Measuring the impact of social adjustments

- Our econometric model can be used to estimate the impact of obligations
- We collect information on whether there are obligations on winners – but could expand this dataset
- This could give a comprehensive estimate of the impact on value
- This relies on operators having full information on the cost of meeting obligations ...

Value	=	constant
	+	$\alpha \cdot \text{bandwidth}$
	+	$\beta \cdot \text{population}$
	+	$\gamma \cdot \text{coverage increment}$
	+	$\delta \cdot \text{speed minimum}$
	...	
	+	ε

Licence obligations model

Explanatory variable	Beta, β
Constant	-2.197457
Log of Licence Duration	0.6764182***
Log of GDP per capita	0.6040613***
Log of Population density	0.1633344***
Log of Spectrum Stock	-1.210178***
Licence obligations dummy	-0.305147**
Band dummies	Varies by band
Year dummies	Varies by year

Note: t statistic in parentheses. Statistical significance: * 10% level, ** 5% level, and *** 1% level.

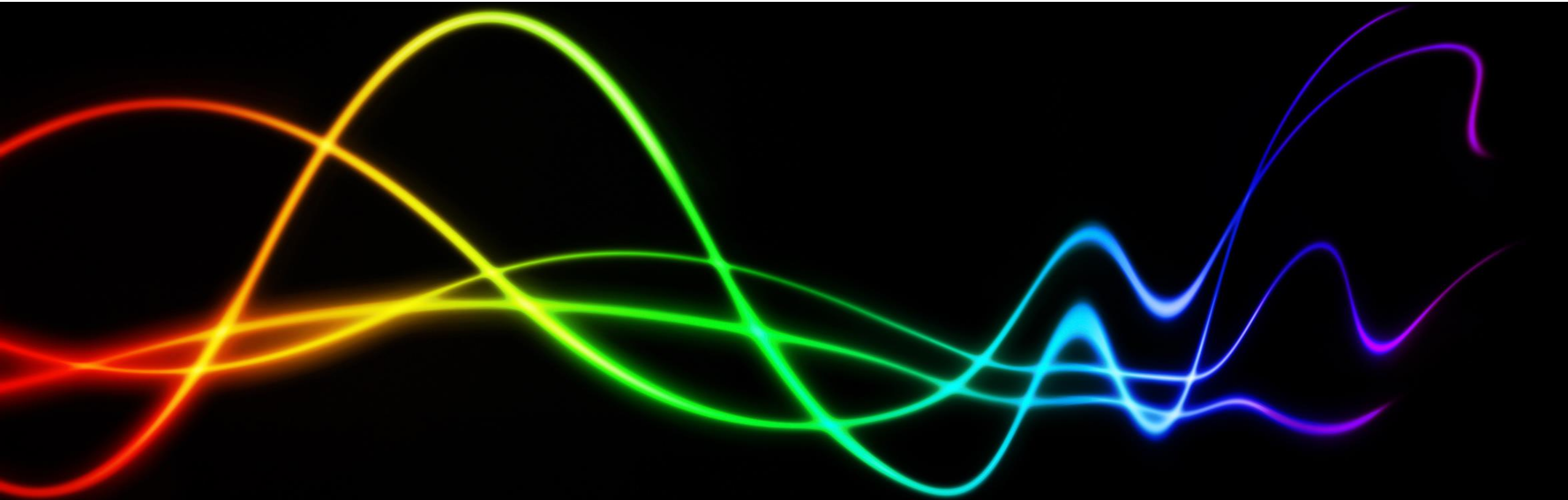
- Explanatory variable (y) is log of US\$/MHz/pop
- Licence obligations dummy captures obligation associated with assignment
 - Population or geographical coverage
 - Rollout (time-based)
 - Service quality
- Licence obligations lower spectrum price
- Negative β (statistically significant at 5% level) captures the private cost to operators to deliver the obligation
- Increasing the operator's private cost will reduce willingness to pay → lowering auction price

Limitation of existing valuation techniques

- Two existing valuation techniques that can be adapted to capture social value-related obligations:
 - Econometrics – include obligations or social value explanatory variables
 - Avoided cost modelling – increase coverage requirements to identify the operators' additional infrastructure costs given the quantity of spectrum assigned
- These techniques can help identify and quantify the **operators' private cost** of delivering socially optimum level of coverage or service
- Use operators' private cost to discount spectrum price (market price)
- These techniques do not estimate social value – the benefits experienced by society
- Social value estimate would require full cost-benefit analysis

Presentation by
Abhaya Sumanasena

uk spectrum policy forum



We hope you have a lovely Christmas break.

Our first open-to-all session is currently our Plenary
28 January 2021 | 14:00-16:00.

Questions or comments?
Jo.oriordan@techUK.org