COMPETITION COMMISSION

Reference under section 193 of the Communications Act 2003

The Carphone Warehouse Group plc v Office of Communications

Case 1149/3/3/09

Determination

31 August 2010

Excisions in this determination marked with [✂] relate to commercially confidential information: Schedule 4, paragraph 1, to the Enterprise Act 2002.

Members of the Competition Commission who conducted this appeal

Peter Freeman CBE, QC *(Chairman of the Group)*

Professor John Cubbin

Tony Morris

Professor Sudi Sudarsanam

Chief Executive and Secretary of the Competition Commission

David Saunders

Contents

Page

WLR Appeal: Introduction to the Competition Commission's determination 1-1
Part 1: Legal framework and procedure 1-1
Part 2: General and economic introduction.. 1-20
WLR Appeal: Overview of the parties' arguments 2-1
Analysis 3-1
Part 1: Reference Question 1 3-1
Part 2: Reference Question 2 3-32

Appendices

A: Terms of reference
Glossary of definitions and frequently used terms

Section 1: WLR Appeal: Introduction to the Competition Commission's determination

Part 1: Legal framework and procedure

Preamble

1.1 On 26 October 2009 the Office of Communications (Ofcom) published a statement entitled *Charge controls for Wholesale Line Rental and related services* (the WLR Statement). The WLR Statement contained decisions made pursuant to sections 45 and 87 of the Communications Act 2003 (the 2003 Act) to impose price controls on British Telecommunications plc (BT) in relation to various services supplied by BT in the market for wholesale analogue exchange line services in the UK (excluding the Hull area). The term of the price controls is set to finish on 31 March 2011.

1.2 Wholesale line rental (WLR) is a product Openreach supplies to communication providers (CPs) allowing them to rent access lines on wholesale terms, and resell the lines to customers. WLR enables CPs to offer their own-branded telephony services over the Openreach network. The WLR product gives consumers the opportunity to choose alternative suppliers who can provide them access and, in almost all cases, calls services.

1.3 The price-controlled services in question are:

(a) the charge for analogue core WLR rental;

(b) the WLR transfer charge; and

(c) the WLR new connection charge.

1.4 In its Wholesale Review,[1] Ofcom decided that BT should be required to provide a wholesale analogue WLR product. Ofcom believed that this remedy would address BT's significant market power (SMP) by requiring it to provide a product that would allow CPs to compete with BT's downstream businesses on an equivalent basis.[2]

1.5 The WLR Statement contained, inter alia, decisions to modify the existing price controls applicable to WLR and connected ancillary services.[3] The products and services affected by the price controls are discussed in more detail in Sections 3 and 6 of the WLR Statement.

The structure of our determination

1.6 Our determination is divided into three sections.

1.7 Section 1 contains two parts:

- Part 1: an introduction to the legal framework and procedural issues concerning the WLR Appeal.

---

[1] Ofcom's review of the wholesale narrowband fixed markets, which included wholesale exchange line services, published 15 September 2009.
[2] WLR Statement §2.14.
[3] The previous price controls for WLR services were set in Ofcom's 24 January 2006 statement, 'Wholesale Line Rental: Reviewing and setting charge ceilings for WLR services'.

- Part 2: an introduction to the WLR Appeal and related economic issues. We also set out an overview of the technology relevant to the WLR Appeal.

1.8 Section 2 comprises an overview of the parties' arguments.

1.9 Section 3 contains two parts addressing the Reference Questions applicable to each of CPW's grounds of appeal as set out in the WLR Notice of Appeal (WLR NoA):

- Part 1: determination in respect of WLR Reference Question 1.

- Part 2: determination in respect of WLR Reference Question 2.

The appeals and the appellate framework

1.10 Appeals were brought by the Carphone Warehouse Group plc (CPW) against the decision of Ofcom contained in the WLR Statement before the Competition Appeal Tribunal (the Tribunal) under section 192 of the 2003 Act (the LLU Appeal). British Sky Broadcasting Limited (Sky) and BT both intervened (the Interveners).

1.11 The 2003 Act provides for a specific appellate regime for appeals relating to price controls imposed by Ofcom. It provides, in relevant part:

> **192 Appeals against decisions by OFCOM, the Secretary of State etc.**
>
> …
>
> (2) A person affected by a decision to which this section applies may appeal against it to the Tribunal.
>
> …
>
> (5) The notice of appeal must set out—
>
> (a) the provision under which the decision appealed against was taken; and
>
> (b) the grounds of appeal.
>
> (6) The grounds of appeal must be set out in sufficient detail to indicate—
>
> (a) to what extent (if any) the appellant contends that the decision appealed against was based on an error of fact or was wrong in law or both; and
>
> (b) to what extent (if any) the appellant is appealing against the exercise of a discretion by OFCOM, by the Secretary of State or by another person.
>
> …
>
> **193 Reference of price control matters to the Competition Commission**
>
> (1) Tribunal rules must provide in relation to appeals made under section 192(2) relating to price control that the price control matters arising in that appeal, to the extent that they are matters of a description specified in the rules, must be referred by the Tribunal to the Competition Commission for determination.

(2) Where a price control matter is referred in accordance with Tribunal rules to the Competition Commission for determination, the Commission is to determine that matter—

(a) in accordance with the provision made by the rules;

(b) in accordance with directions given to them by the Tribunal in exercise of powers conferred by the rules; and

(c) subject to the rules and any such directions, using such procedure as the Commission consider appropriate.

(3) The provision that may be made by Tribunal rules about the determination of a price control matter referred to the Competition Commission in accordance with the rules includes provision about the period within which that matter is to be determined by that Commission.

(4) Where the Competition Commission determines a price control matter in accordance with Tribunal rules, they must notify the Tribunal of the determination they have made.

(5) The notification must be given as soon as practicable after the making of the notified determination.

(6) Where a price control matter arising in an appeal is required to be referred to the Competition Commission under this section, the Tribunal, in deciding the appeal on the merits under section 195, must decide that matter in accordance with the determination of that Commission.

(7) Subsection (6) does not apply to the extent that the Tribunal decides, applying the principles applicable on an application for judicial review, that the determination of the Competition Commission is a determination that would fall to be set aside on such an application.

…

(9) For the purposes of this section an appeal relates to price control if the matters to which the appeal relates are or include price control matters.

(10) In this section ‘price control matter’ means a matter relating to the imposition of any form of price control by an SMP condition the setting of which is authorised by—

(a) section 87(9);

(b) section 91; or

(c) section 93(3).

…

195 Decisions of the Tribunal

(1) The Tribunal shall dispose of an appeal under section 192(2) in accordance with this section.

(2) The Tribunal shall decide the appeal on the merits and by reference to the grounds of appeal set out in the notice of appeal.

(3) The Tribunal's decision must include a decision as to what (if any) is the appropriate action for the decision-maker to take in relation to the subject-matter of the decision under appeal.

(4) The Tribunal shall then remit the decision under appeal to the decision-maker with such directions (if any) as the Tribunal considers appropriate for giving effect to its decision.

(5) The Tribunal must not direct the decision-maker to take any action which he would not otherwise have power to take in relation to the decision under appeal.

(6) It shall be the duty of the decision-maker to comply with every direction given under subsection (4).

…

1.12 The Tribunal rules referred to in section 193 are the Competition Appeal Tribunal (Amendment and Communications Act Appeals) Rules 2004 (SI 2004 No 2068) (the 2004 Rules). The 2004 Rules provide, in relevant part:

Reference of price control matters to the Competition Commission

3.—(1) For the purposes of subsection (1) of section 193 of the Act, there is specified every price control matter falling within subsection (10) of that section which is disputed between the parties and which relates to—

(a) the principles applied in setting the condition which imposes the price control in question,

(b) the methods applied or calculations used or data used in determining that price control, or

(c) what the provisions imposing the price control which are contained in that condition should be (including at what level the price controls should be set).

…

(5) The Tribunal shall refer to the Commission for determination in accordance with section 193 of the Act and rule 5 every matter which … it decides is a specified price control matter.

…

Determination by Competition Commission of price control matters

5.—(1) Subject to any directions given by the Tribunal (which may be given at any time before the Commission have made their determination), the Commission shall determine every price control matter within four months of receipt by them of the reference.

(2) The Tribunal may give directions as to the procedure in accordance with which the Commission are to make their determination.

(3) The Tribunal may give directions under this rule of its own motion or upon the application of the Commission or of any party.

1.13 The SMP conditions imposed by Ofcom in the WLR Statement[4] were imposed pursuant to section 87(9) of the 2003 Act. Accordingly, the price control matters in the WLR Appeal fell to be identified and referred to us for determination.

The Tribunal's reference

1.14 In the Tribunal's order entitled *Reference of Specified Price Control Matters to the Competition Commission* dated 18 February 2010 (the Reference), the Tribunal identified a number of specified price control matters within the meaning of Rule 3(1) of the 2004 Rules for referral to the Competition Commission (CC).

1.15 The Reference required us to determine two questions going to whether Ofcom had erred for specific reasons given by CPW. A final question (Question 3) asked us to include in our determination, if the answers to any of the previous questions were 'yes', clear and precise guidance as to how any such error found should be corrected and, in so far as was reasonably practicable, a determination as to any consequential adjustments to the level of the price controls.. A copy of the Reference is at Appendix A.

1.16 We set out the main arguments and evidence put to us by the parties and conclude with our assessment and conclusions in determining whether Ofcom has erred for any of the reasons put to us.

The legal framework

1.17 Regulation of the telecommunications sector takes place across Europe under what is known as the European Common Regulatory Framework (CRF). The CRF consists of a number of Directives, the most relevant of which are Directive 2002/21/EC on the common regulatory framework for electronic communications networks and services (the Framework Directive) and Directive 2002/19/EC on access to, and interconnection of, electronic communications networks and associated facilities (the Access Directive). The CRF imposes on member states the obligation to designate independent national regulatory authorities (NRAs), sets out objectives and principles that the NRAs are to be guided by in carrying out their functions, obliges them to carry out market reviews, and empowers them to impose certain obligations on undertakings with SMP including price controls. Of particular relevance to the WLR Appeal are Articles 8 and 13 of the Access Directive, which provide, in relevant part:

Article 8

Imposition, amendment or withdrawal of obligations

1. Member States shall ensure that national regulatory authorities are empowered to impose the obligations identified in Articles 9 to 13.

2. Where an operator is designated as having significant market power on a specific market as a result of a market analysis carried out in accordance with Article 16 of Directive 2002/21/EC (Framework Directive), national regulatory authorities shall impose the obligations set out in Articles 9 to 13 of this Directive as appropriate.

---

[4]The price controls were set by condition AAA4(WLR) in Annex 6, Schedule 1 of the WLR Statement.

…

Article 13

Price control and cost accounting obligations

1. A national regulatory authority may, in accordance with the provisions of Article 8, impose obligations relating to cost recovery and price controls, including obligations for cost orientation of prices and obligations concerning cost accounting systems, for the provision of specific types of interconnection and/or access, in situations where a market analysis indicates that a lack of effective competition means that the operator concerned might sustain prices at an excessively high level, or apply a price squeeze, to the detriment of end-users. National regulatory authorities shall take into account the investment made by the operator and allow him a reasonable rate of return on adequate capital employed, taking into account the risks involved.

2. National regulatory authorities shall ensure that any cost recovery mechanism or pricing methodology that is mandated serves to promote efficiency and sustainable competition and maximise consumer benefits. In this regard national regulatory authorities may also take account of prices available in comparable competitive markets.

1.18 The UK's NRA is Ofcom and the CRF was implemented in the UK by the 2003 Act, in which the powers and duties set out in the Directives are reflected.

1.19 Section 45 of the 2003 Act provides Ofcom with the power to set binding conditions, including SMP conditions. An SMP condition can be applied to a CP that Ofcom has determined as having SMP in a specific market (sections 46(7)–(8)), but only if Ofcom is satisfied that the following tests (found in section 47) are met:

(a) that the condition is objectively justifiable in relation to the networks, services, facilities, apparatus or directories to which it relates;

(b) that the condition is not such as to discriminate unduly against particular persons or against a particular description of persons;

(c) that the condition is proportionate to what it is intended to achieve; and

(d) that the condition is, in relation to what it is intended to achieve, transparent.

1.20 Section 87(9) gives Ofcom the specific power to set SMP conditions that impose price controls. The imposition of price controls is subject to section 88, which provides, in relevant part:

88 Conditions about network access pricing etc.

(1) OFCOM are not to set an SMP condition falling within section 87(9) except where—

(a) it appears to them from the market analysis carried out for the purpose of setting that condition that there is a relevant risk of adverse effects arising from price distortion; and

(b) it appears to them that the setting of the condition is appropriate for the purposes of—

(i) promoting efficiency;

(ii) promoting sustainable competition; and

(iii) conferring the greatest possible benefits on the end-users of public electronic communications services.

(2) In setting an SMP condition falling within section 87(9), OFCOM must take account of the extent of the investment in the matters to which the condition relates of the person to whom it is to apply.

1.21 The 2003 Act, in line with the CRF, also imposes more general duties upon Ofcom. These include, in section 3, duties to further the interests of citizens in relation to communications matters and to further the interests of consumers in relevant markets, where appropriate by promoting competition. Section 4 imposes certain duties on Ofcom for the purpose of fulfilling EU obligations, which, in so far as are relevant, include a requirement to promote competition in relation to the provision of electronic communications networks and services, and a requirement to take account of the desirability of it carrying out its functions in a manner which, so far as practicable, does not favour one form of electronic communications network, service or associated facility over another or one means of providing or making available such a network, service or facility over another.

1.22 Although the specific questions that have been referred to us for determination focus on particular aspects of the price controls, we have had regard, in relation to each of them as well as in relation to our overall conclusions, to the CRF and the domestic provisions implementing it. We consider our conclusions to be consistent with the legal framework.

The purpose of our jurisdiction

1.23 In determining the nature of the investigation, we paid particular regard to the judgments of the Tribunal in relation to the price control matters in *Hutchison 3G UK Limited v Office of Communications* (Case 1083/3/3/07) and *British Telecommunications plc v Office of Communications* (Case 1085/3/3/07) which concerned wholesale voice mobile call termination charges (Calls to Mobiles Appeal).[5]

1.24 In the Calls to Mobiles Appeal, the Tribunal noted that the aim of the statutory provisions was that the disposal of the appeal, incorporating the determination, should result in as high a degree of finality as possible, having regard to the grounds of appeal and the nature of the CC's findings. In that case, it encouraged the CC to conduct its investigation in such a manner and to express its determination in such terms as to make clear what directions it should give in respect of the specified price control matters when remitting the decision to Ofcom. The Tribunal considered it desirable that those directions and the disposal of the appeals should, in effect, settle the question of what the price control should be for the period covered by Ofcom's Statement on Mobile Call Termination,[6] and stated that the CC should carry out its investigation with that goal firmly in mind.[7] It added that the Reference Questions had been drafted in such a way as to acknowledge the possibility that it might not be possible for the CC to set an alternative price control, but so as to ensure as far as possible that the appeal resulted in a revised price control being finalized without delay and avoided a situation where there were issues which required substantial

[5] *[2009] CAT 11* (Judgment: Disposal of the Appeals).
[6] Published 27 March 2007.
[7] *[2008] CAT 5*, paragraph 15.

further work and the exercise of judgement by Ofcom.[8] We believe that the same principles apply in the WLR Appeal.

1.25 In the judgment disposing of the appeals, dated 2 April 2009,[9] the Tribunal decided the price control matters in accordance with the CC's *Mobile phone wholesale voice termination charges* determination, notified to the Tribunal on 16 January 2009 (MCT Determination).[10] We have approached the conduct of the present determination with the wording of the Reference, and the approach taken in the Calls to Mobiles Appeal, firmly in mind.

The standard of review

1.26 We have followed the same approach to the standard of review as was taken in the Calls to Mobiles Appeal. The standard was set out in paragraphs 1.30 to 1.33 of the MCT Determination and we restate the relevant principles here.

1.27 Section 195(2) of the 2003 Act provides for an appeal on the merits. Section 192(6) shows that appeals can be brought on the basis of errors of fact or law or against the exercise of a discretion. In the Calls to Mobiles Appeal, the Tribunal interpreted its role under a section 192 appeal as being one of a specialist court designed to be able to scrutinize the detail of regulatory decisions in a profound and rigorous manner. In our view, our role in determining the specified price control matters that have been referred to us is similar. This is the role that appears to have been contemplated for us by the Tribunal in its Reference ruling and in the wording of the Reference itself (Reference Question 3 in particular).

1.28 The wording of Rule 3 of the 2004 Rules envisages a determination of disputes that relate to the principles or methods applied or the calculations or data used in determining a price control, as well as disputes that relate to what the provisions imposing the price control should be including at what level the price control should be set. That also suggests a rigorous and detailed examination of the price control matters subject to appeal.

1.29 We have carried out that examination, in respect of Reference Questions 1 and 2, with the purpose of determining whether Ofcom erred for any of the specific reasons put forward by the parties. In determining whether it did so err, we have not held Ofcom to be wrong simply because we considered there to be some error in its reasoning on a particular point—the error in reasoning must have been of sufficient importance to vitiate Ofcom's decision on the point in whole or in part. This is the standard set out in paragraph 1.32 of the MCT Determination and it is the approach that we have adopted in this appeal.

1.30 In its response to our provisional determination in the LLU Appeal, CPW criticized this approach.[11] CPW said that even if Ofcom happened, fortuitously, to have stumbled across a correct outcome, then that did not mean it did not err in its methodology. CPW submitted that we should consider whether, notwithstanding that no adjustment to the price control was necessary, Ofcom's methodology was in fact flawed. CPW further requested that the CC should clearly identify the methodology which Ofcom should adopt in future price controls and that, in so far as it did not adopt that methodology in the LLU price control, then it did err.

---

[8] ibid, paragraph 16.
[9] *[2009] CAT 11* (Judgment: Disposal of the Appeals).
[10] The MCT Determination is available at:
www.competition-commission.org.uk/appeals/communications_act/mobile_phones_determination.pdf.
[11] See §§54 & 55 of CPW's response to the LLU provisional determination.

1.31 The role of the CC in the present appeal is to answer the questions referred to it by the Tribunal. We have done so in the course of this written determination. We have addressed below the methodology adopted by Ofcom and identified any errors in approach in the course of the narrative of the written determination. We have also identified any areas where the reasons given by Ofcom in the LLU Statement were inadequate or where the right result was reached for the wrong reasons.

1.32 However, if the price control is set correctly notwithstanding a flaw in the methodology adopted by Ofcom, there is no error in the price control. In such circumstances, the proper answer to the Tribunal's Reference Question will accordingly remain that no error in the price control is disclosed. The jurisdiction we exercise is, as we have already observed, to consider an appeal on the merits against Ofcom's decision. We do not exercise a merely supervisory jurisdiction to consider whether the reasons given in the decision are flawed.

1.33 It will nonetheless be apparent from the narrative description given in the written determination below where, if at all, we have considered that Ofcom has adopted an incorrect approach or methodology to a particular issue. We would also add that if, in a future appeal, we considered that the absence or inaccuracy of reasons adopted by a regulator meant that we could not understand the decision that had been reached, we might well conclude that the end result could therefore not be justified on the material before us. This may be of most significance where Ofcom would otherwise ask for, and receive, some margin of appreciation for its expertise as a specialist regulator.

1.34 We have, however, borne in mind that Ofcom is a specialist regulator whose judgement should not be readily dismissed. Where a ground of appeal relates to a claim that Ofcom has made a factual error or an error of calculation, it may be relatively straightforward to determine whether it is well founded. Where, on the other hand, a ground of appeal relates to the broader principles adopted or to an alleged error in the exercise of a discretion, the matter may not be so clear. In a case where there are a number of alternative solutions to a regulatory problem with little to choose between them, we do not think it would be right for us to determine that Ofcom erred simply because it took a course other than the one that we would have taken. On the other hand, if, out of the alternative options, some clearly had more merit than others, it may more easily be said that Ofcom erred if it chose an inferior solution. Which category a particular choice falls within can necessarily only be decided on a case-by-case basis.

1.35 The parties have made various submissions in relation to the standard of review that should be adopted by us on price control references.[12] While the parties accepted the principles set out in the MCT Determination above, there was some debate as to how these principles should be interpreted. The parties submitted their comments on the standard review in response to our provisional determination in the LLU Appeal and these comments were repeated for the purpose of the WLR Appeal.[13]

1.36 The parties were generally agreed on the following aspects concerning the standard of review:

[12]The parties essentially restated their submissions concerning standard of review as provided in the LLU Appeal. The parties made submissions concerning standard of review in written skeleton arguments in the LLU Appeal. In accordance with the Tribunal's direction of 26 January 2010 (see paragraph 1.65 below), we consider these submissions contained in the LLU written skeletons as part of the WLR Appeal.
[13]As stated by the parties in their responses to the WLR provisional determination.

(a) the appeal is an appeal on the merits before a specialist tribunal. The CC discharges an appellate role under section 193(1) of the 2003 Act;

(b) Ofcom's decision must be subjected to profound and rigorous scrutiny; and

(c) the nature of guidance to be given by the CC in answering the Reference Questions.

1.37 There was a dispute between the parties concerning the interpretation of the relevant paragraphs on the standard of review as set out in the MCT Determination concerning:

(a) materiality;

(b) the relevance of the TMobile & O2 case (and other cases cited by Ofcom) to considering full appeals on the merits;[14]

(c) the requirement for a more stringent review where there is a prospective analysis; and

(d) the effect on the standard of review of the alleged inadequate consultation undertaken by Ofcom in connection with the WLR Statement.

Materiality

1.38 Ofcom raised the issue of materiality in its Defence[15] where it submitted that CPW had mistaken our role in undertaking a review of price control matters. Ofcom submitted that we should proceed with caution in seeking to revisit detailed issues that required a fine weighing and balancing of evidence and that had been considered and consulted upon exhaustively by Ofcom. Ofcom submitted that we could not sensibly act as a substitute regulator, revising all aspects of Ofcom's decision making, even where there were several alternative solutions potentially available to any given regulatory problem. According to Ofcom, our task was, instead, to identify whether Ofcom was materially wrong. Ofcom submitted that CPW failed to show any such material error in relation to any of its grounds of appeal.

1.39 CPW submitted[16] that, with regard to materiality:

(a) its challenge raised substantial issues of economic principle (Ofcom did not dispute this);

(b) any error in the price set for the current charge control period would have persisting effects into the next charge control period (Ofcom did not dispute this);

(c) the very nature of a price control was that tens of assumptions combined to produce an overall cost estimate and so to dismiss a challenge to any individual assumption (viewed in isolation), on the basis that it was only one assumption, would effectively negate the ability to challenge a price control decision; and

(d) none of its grounds raised points which were 'immaterial'.

[14] *T-Mobile (UK) Ltd and Telefonica O2 v. Ofcom [2008] EWCA Civ 1373,* CA.
[15] Ofcom WLR Defence §10.
[16] CPW Written Skeleton §11 (submitted in the LLU Appeal).

1.40 Ofcom submitted in its skeleton argument[17] that it could be deduced from the Calls to Mobiles Appeal that the CC exercised the following restraints when examining the exercise of a discretion by Ofcom:

(a) having regard to the materiality of errors;

(b) recognizing a margin of discretion for Ofcom; and

(c) avoiding substitution of judgment without good reason.

1.41 Ofcom then went on to state in its skeleton argument that 'Ofcom's analysis of materiality is intended to assist the CC in focussing its resources … the CC is … entitled to decide how much time and effort to devote to the many detailed points raised under each ground of appeal'.[18]

1.42 CPW concluded that a 'materiality' threshold entered the picture only in the sense that, if the CC concluded that Ofcom erred on a particular point, and if it were to substitute its own view, this would make no substantive difference to the result on that point. CPW noted that, even in that situation, great caution would be needed. CPW submitted that the potential knock-on effect of the same error being repeated in the next price control must be borne in mind and that the CC should nonetheless set out clearly what approach should have been adopted by Ofcom in any event. CPW therefore stated that, in practice, the present case was likely to involve no real scope for any materiality issues to arise.[19]

1.43 Sky submitted in its written skeleton that there was no basis for Ofcom seeking to introduce a materiality threshold into the test to be applied by the CC.[20]

1.44 It is apparent that a number of issues have been canvassed under the heading of materiality, including the margin of appreciation allowed to the regulator. In our provisional determination we said that we intended to assess the materiality of errors found cumulatively, by value, and by reference to each Reference Question or sub-part thereof. Both CPW and Sky took issue with aspects of this approach in their responses to our provisional determination. While the purpose of provisional determinations is not generally to stimulate fresh argument, we will address the points made by CPW and Sky below, as indeed we address a limited number of responses to provisional determinations in other sections of this determination.

1.45 In response to our provisional determination, CPW said[21] that materiality was a vitally important issue, as small errors on individual elements of the price control may well give rise cumulatively to material errors overall, even if, when taken individually, they were considered to be immaterial. CPW contended that all of the errors identified by it were material when considered on a cumulative basis.[22]

1.46 CPW submitted that, where errors had been identified by the CC in accordance with the grounds of appeal, it was necessary for the CC to take account of their cumulative impact not only in relation to each Reference Question separately, but across the grounds of appeal as a whole.[23] This would involve the CC addressing all

[17] Ofcom Written Skeleton §6(c).
[18] Ofcom Written Skeleton §11(c).
[19] CPW Reply I §33.
[20] Sky generally supported CPW's submissions with regard to standard of review. See Sky Written Skeleton.
[21] CPW response to the LLU provisional determination, §13.
[22] CPW response to the LLU provisional determination, §§12–18.
[23] CPW response to the LLU provisional determination, §14.

errors identified cumulatively and then considering whether there was any material impact on the price control as a whole.

1.47 In response to our provisional determination, Sky referred to §1.27 of the introductory chapter to the LLU provisional determination and made the following criticisms[24] of the CC's proposed approach:[25]

(a) This passage appears to be ambiguous. To the extent that it means that an error must have some effect on the final decision by Ofcom (or some part of that decision, however small), then Sky agrees with it. If it means that small errors in the price control should not be taken into account in assessing whether Ofcom has erred, because these are not sufficiently material to vitiate Ofcom's decision (or part of it), then Sky disagrees.

(b) Sky does not consider it appropriate to apply a materiality threshold when considering whether Ofcom has erred.

(c) To the extent that the CC has found Ofcom to be in error in relation to a point raised in the appellant's grounds of appeal, this is sufficient to vitiate Ofcom's decision (at least in part).

(d) There may be a separate question as to whether it is appropriate and proportionate to require the error to be corrected, but this goes to the appropriate remedy, not to whether Ofcom has erred.

Prospective analysis

1.48 CPW submitted in its NoA that in setting a price control Ofcom purported to be engaged in a prospective analysis. Accordingly, its decision must be 'sufficiently rigorous and thorough [and] because the likelihood of error is greater in a prospective analysis, the prospective analysis must be proportionately more rigorous to account for this possibility'.[26]

1.49 Ofcom submitted that CPW was wrong to contend that a more stringent standard of review should apply to Ofcom's prospective analysis and that this counter-intuitive proposition was wrong in principle. Ofcom submitted that it did not follow from the EU case law considered in *Hutchison 3G (UK) Limited v. Ofcom [2005] CAT 39*; and was not specifically endorsed by the Tribunal in that case. On the contrary, Ofcom submitted that it would be appropriate to accord a more generous *margin of discretion to a regulator in respect of judgments* about future events, in relation to which there is an inherent element of uncertainty. Ofcom made reference to the remarks of Lightman J in *R v. Director General of Telecommunications ex parte Cellcom* [1999] ECC 314 (emphasis added):

> The court must be astute to avoid the danger of substituting its views for the decision makers and of contradicting a conscientious decision maker acting in good faith … If (as I have stated) the court should be very slow to impugn decisions of fact made by an expert an experienced decision maker, it must surely be *even slower to impugn his educated prophecies and predictions for the future.*

---

[24]Sky response to the LLU provisional determination, §4.
[25]This approach was also set out in §29 of the introductory chapter to the WLR provisional determination.
[26]CPW made reference to *Hutchison 3G (UK) Limited v Ofcom* [2005] CAT 39 at [33], which endorsed the approach of the Irish Electronic Communications Appeals Panel in Decision No: 02/05 at 4.23 in respect of appeal ECAP 2004/01).

1.50 Ofcom then stated in its skeleton argument[27] that:

(a) Price control analysis required a regulator to make assessments as to what would happen over the period of the price control (and beyond) in respect of the regulated undertaking's costs and volumes. Such assessments were unavoidable. Equally, they carried an unavoidable, and often relatively significant, element of uncertainty. In Ofcom's submission, it was wrong in principle to suggest that a regulator should be held to any higher standard as regarded the rigour of its prospective analysis than in relation to its findings on past events.

(b) An expert appellate body like the CC could and should still recognize the uncertainties inherent in future predictions. It should only substitute judgment where there was good reason for preferring an alternative prediction to that relied on by the regulator. It certainly should not seek to hold the regulator to a higher standard of scrutiny.

(c) CPW had relied in its skeleton argument on comments of the Tribunal in *Vodafone v. Ofcom [2008] CAT 22*, §48. However, Ofcom submitted that those remarks were obiter, as was clear from the subsequent paragraph of the Tribunal's judgment which CPW omitted to reproduce, in which the Tribunal concluded that it was not 'necessary, in the circumstances, to address further the question of whether a higher standard applies in the context of prospective analysis' (§49).

(d) In its NoA, by contrast, CPW had referred to the judgment of the Tribunal in *Hutchison 3G (UK) Limited v. Ofcom [2005] CAT 39*, §33. However, Ofcom stated that in that case, the Tribunal expressly endorsed the conclusion of the Irish appeal body, ECAP, that a regulator had to meet any higher standard of proof in relation to ex ante analysis. Ofcom submitted that this suggestion that prospective analysis must be 'proportionately more rigorous' than ex post analysis was clearly specific to the issue of significant market power. For the reasons set out above, Ofcom submitted that it would be wrong as a matter of principle to regard it as having any more general application.

The effect of the alleged inadequate consultation on the standard of review

1.51 CPW submitted in its skeleton arguments[28] that the alleged inadequacy of Ofcom's consultation undermined the basis for any margin of discretion which it might otherwise have possessed.

The burden of proof and questions of transparency

1.52 In response to our provisional determination, CPW raised a new but related issue concerning our approach to determining the Reference Questions. It concerned who had the burden of proof in showing that Ofcom had erred. CPW stated that it was important for the CC to adopt an express, clear and principled approach in relation to the burden of proof since it had general ramifications for the CC's approach to a number of the points of appeal.[29]

1.53 CPW stated that it was incumbent on Ofcom, in relation to all aspects of the price control, to justify its approach on the basis of sound reasoning and cogent evidence.

---

[27] Ofcom Written Skeleton, §10(a).
[28] CPW Written Skeleton, §4.
[29] CPW response to the LLU provisional determination, §4.

1.54 CPW argued that, given the lack of information available to it, CPW could not be expected to provide evidence which lay within BT's possession or control, and which Ofcom needed to obtain. CPW referred to the difficulties it said that it had experienced in obtaining disclosure of documents and information in the course of the appeal and had emphasized the severely disadvantaged position in which CPW believed it had found itself as a result.

1.55 CPW argued that it was essential that the CC, in formulating its general approach in price control appeals, did not place a burden of proof on appellants in the position of CPW that was, in reality, 'impossible to discharge'. CPW argued that this would make appeals on certain issues so difficult as to render those points, in practical terms, immune from effective scrutiny on appeal.

1.56 CPW set out specific examples from the provisional determination where we had given our provisional conclusion that CPW's ground of appeal should be dismissed on the basis of a lack of evidence, and where CPW claimed that this was, in fact, evidence which CPW could not be expected to possess.

Our assessment

1.57 As stated above, we followed the approach adopted in the Calls to Mobiles Appeal.

1.58 As stated above, we followed the approach adopted in the Calls to Mobiles Appeal. We also note the judgment handed down by the Court of Appeal in the Calls to Mobiles Appeal.[30] In particular, we have considered whether Ofcom erred for any of the specific reasons put forward by the parties. We have assessed each Reference Question on the basis of the facts and the specific exercise undertaken by Ofcom and considered whether CPW, where relevant supported by Sky, has demonstrated that Ofcom did err.

1.59 Where we have not fully understood a party's arguments we have sought clarification. In addition, we have sought to test certain evidence or arguments made by a party, where we have felt that it is necessary to do so, in order to assess the cogency and relevance of the evidence. We have also, where appropriate, considered the relevant approach adopted in previous appeals or regulatory practice more generally. We have not, however, carried out additional investigation beyond the scope of the Reference since we do not consider that we have jurisdiction to investigate broader criticisms of the conduct of Ofcom before, during or after the publication of the WLR Statement.

1.60 As with the Calls to Mobiles Appeal, we consider that any error must have been of sufficient importance to vitiate Ofcom's decision on the point in whole or in part. We recognize that certain areas require more discretion than others and we address these points throughout our determination. Below we set out our view of the particular points of contention between the parties.

Materiality

1.61 We consider that there is force in Ofcom's submission that our task is to identify whether Ofcom's decision has been shown to be materially in error. But we have not found it possible to set out a general approach to the assessment of materiality. In practice considerations of materiality are not amenable to a formal analytical scheme.

[30] [2010] EWCA Civ 391.

We have considered materiality on a case-by-case basis as part of our analysis of specific criticisms made by CPW of Ofcom's decision making.

1.62 In answering each Reference Question put to us by the Tribunal, we have considered materiality at three stages of our decision making process.

1.63 First, we have found that Ofcom has made no error if the effort that Ofcom would have had to expend to satisfy CPW's criticisms would have been disproportionate to the likely change that it would make to the price control. The principle of considering proportionality in this way is generally accepted by the parties. For example, in our assessment in the LLU Appeal, in relation to questions of cost allocation, we have supported some decisions taken by Ofcom on the ground that Ofcom as the regulator was faced with some real uncertainty about the possibility of obtaining greater certainty through further investigation. We have found that Ofcom was entitled to take into account the materiality of the sums involved and the likelihood of obtaining greater clarity in deciding whether to expend further time and resource on further investigation.

1.64 Secondly, we have concluded that Ofcom did not err in setting the price control where any error of fact or approach did not have a material effect on the price control set. This means that any errors we have found must have been capable of producing some material effect upon the actual price control. We have concluded that an error will not be a material error where it has only an insignificant or negligible impact in relative terms on the overall level of price control that has been set by Ofcom. Where, for example, the impact of any perceived error would be a 0.1 per cent change in the price control level we have concluded that such an impact is not material. It would fall within an acceptable margin of error for a regulator.

1.65 We have considered materiality in this second stage by assessing the value of each particular error found. We have not assessed materiality on the basis of the cumulative value of all the errors we have found, as CPW argued we should. Nor have we assessed materiality on the cumulative value of errors found within a Reference Question or sub-reference question as we proposed in our provisional determination. This issue arose specifically in the LLU Appeal. In the LLU determination we identified only one error that was not material. This was the misallocation of the costs of management of services in Northern Ireland, on which our determination can be found in paragraph 2.613 of the LLU determination. Consequently, we did not have to decide whether or not to aggregate errors that are not material because there were no such errors to aggregate.

1.66 However, because the parties to the appeal have made representations on our approach to materiality we think it right to address the issue in case it is of assistance to parties to future appeals and to the CC in its consideration of them. We restate here our approach as set out in the LLU Appeal. As with materiality generally, we have not identified a formal general approach that would determine when, if at all, immaterial errors should be aggregated. We are mindful that to aggregate immaterial errors has the effect of converting an error that is in and of itself immaterial into a material error through its combination with other immaterial errors. These other errors may be unrelated and may lie in different and discrete aspects of the price control. We do not wish to rule out the possibility that in future appeals there may be cases where such aggregation is justifiable where the cumulative effect of discrete errors had a highly significant impact on the price control set by Ofcom. But as a general approach we would be cautious about elevating the immaterial into the material. We also observe that aggregation might encourage a scattergun approach on the part of appellants in future appeals, with a great number of wholly insignificant points taken by an appellant in the hope that if assessed on a cumulative basis, all such minor points will be remedied. We do not think this is the purpose of this appeal process, which is to carry out an appellate review of Ofcom's decision and not to retake the decision itself.

1.67 Third, we have considered materiality when deciding whether it is proportionate for the error to be corrected. This consideration of materiality goes to determining whether a remedy is appropriate or not. In terms of materiality in remedies we do not specifically look at the value of the error as such but at the balance between the effort and effect (or cost and benefit) of correcting such error. There are no remedies to consider in this appeal.

Prospective analysis

1.68 We have not found it possible to accept a general prescription as to the consequences of the frequently prospective nature of many of the tasks Ofcom performed in the course of preparing the WLR Statement. We have subjected Ofcom's decisions to thorough scrutiny. In reaching our conclusions, we have been mindful of the nature of the tasks, their difficulty, and the degree of judgement required of Ofcom.

1.69 As we have already stated, we will only substitute our judgement where there is good reason to prefer an alternative approach to that relied on by the regulator.

1.70 The prospective nature of Ofcom's decisions is one element that we have taken into account when deciding whether one approach is better than another. There is consensus that the appeals before us are appeals on the merits and that Ofcom's decisions are subject to rigorous scrutiny. In our scrutiny, we have found it more useful to ask whether we think Ofcom has been shown to have erred in all the circumstances, rather than whether a particular aspect of a determination is particularly forward looking, or is a lesser mix of prospective and other analytical issues.

Ex post facto rationalization

1.71 In the WLR Appeal, CPW provided us with examples of situations where it claimed that Ofcom had explained its reasoning behind the price controls only following publication of the WLR Statement. For example, Dr Houpis stated[31] that one of Ofcom's justifications for its approach to 'technology neutrality' had been introduced in the WLR Appeal but had not been mentioned in Ofcom's consultations or in the LLU or WLR Statements. The Tribunal ruled on this particular issue[32] concluding that this justification was in fact identifiable from the WLR Statement and was not a case of ex post facto rationalization.

1.72 Our focus during the WLR Appeal has been on deciding whether the price controls have been set at the correct level and our first concern is to establish whether an appellant such as CPW can show that Ofcom has failed to set the right level of charge. We do not expect the WLR Statement to be an exhaustive statement of each and every consideration that Ofcom took into account in reaching its decision, or on which it may subsequently rely in answer to a challenge such as that now made by CPW. Arguments made, and points relied on, can very often be articulated more fully without their first iteration being found inadequate. Further, it is inevitable that in a process such as the present appeal there will be some development of the arguments, and this applies equally to all the parties to the price control appeal.

---

[31]CPW W/S Houpis VI, §13.
[32]Letter from the Tribunal to Osborne Clarke dated 5 March 2010.

1.73 However, it is important that decisions such as the WLR Statement are sufficiently transparent. While there are many reasons for transparency, there are two that are of immediate concern for the CC in Communications Act appeals. These are, first, that the more transparent Ofcom's decision making is, the more efficient the appeal process will be. The extent to which decisions are transparent is one of the factors that bears on the speed with which appeals can be referred to the CC by the Tribunal, and then disposed of by the CC. Secondly, the reasoning in Ofcom's decision is particularly important where Ofcom wishes to be accorded a margin of appreciation as the regulator and for its regulatory expertise.

1.74 However, in our view nothing in the WLR Appeal turns on the presence or significance of the ex post facto argument.

Our procedure

1.75 For this reference we adopted a procedure which, in our view, was suited to the nature of our task.[33] We received financial models used by Ofcom in setting the price control. Ofcom provided an explanation of some of these models in a meeting with Ofcom (attended by all parties). We received written arguments and evidence from the parties, held both plenary and bilateral hearings, issued requests (copied to all parties) where we considered that we needed further information, and issued provisional determinations for comment. Overall, a great deal of material was submitted throughout the process. We have taken very careful account of all the material submitted to us, including responses to our provisional determinations.

1.76 It would not be practicable to refer to or summarize in this determination all the submissions and evidence that we received from each party. Instead, in the sections that follow, we have attempted to refer to what we considered to be the key submissions and pieces of evidence in relation to each of the points we considered.

Confidentiality ring

1.77 A confidentiality ring had been established by the Tribunal on 26 February 2010[34] and we adopted the Tribunal's confidentiality ring as part of our procedure.

The proposed consolidation of the LLU and WLR Appeals

1.78 CPW considered that there should have been consolidation of the LLU and WLR Appeals and it requested a direction from the Tribunal in accordance with Rule 17 of the Competition Appeal Tribunal Rules 2003.

1.79 Ofcom agreed with CPW that the two appeals be consolidated.[35] Initially, we did not express a view as to whether the appeals should be consolidated, but we did recognize the similarity of the price control issues raised in the two appeals.[36]

1.80 The Tribunal acknowledged that various issues raised by the WLR Appeal were similar to those raised by the LLU Appeal. However, it concluded that the two

[33] We informed the parties of the main steps in the procedure that we envisaged in our First Day Letter of 18 December 2009.
[34] The confidentiality ring was established by an order of the Tribunal of 1 October 2009, following discussion at a case management conference held on the same date.
[35] Letter from Ofcom to the Tribunal dated 18 January 2010.
[36] Letter from the CC to the Tribunal dated 15 January 2010.

appeals must be kept distinct.[37] The Tribunal did acknowledge that it may be appropriate for certain matters raised by both appeals to be heard at the same time.

1.81 We wrote to the Tribunal[38] to state our concerns regarding the timing of the LLU and WLR Appeals and also to note which matters ought to be heard in parallel. Our view was that the price control elements of both appeals should be heard in parallel given the significant overlaps between the two appeals. We said that each of Ofcom's decisions was important context for the other and our conclusions in each appeal would be important context for our decisions in the other. We deemed this to be very important in relation to the price/cost differential issue raised in both appeals and also in assessing whether an adjustment to either price control would be necessary. We expressed our view that there would be advantages to the parties and the CC, in terms of economy and clarity in consolidating the two appeals.

1.82 In conclusion, the Tribunal did not accept that it was necessary or appropriate for the appeals to be consolidated. The Tribunal stated that we could, if we considered it appropriate, adopt procedures in the appeals to enable overlapping price control matters to be considered together.[39]

LLU submissions

1.83 In a communication from the Tribunal to CPW dated 26 January 2010, the Tribunal directed that all documents served or disclosed in the LLU Appeal may be used for the purposes of the WLR Appeal.[40] Furthermore, at each of the bilateral hearings with the parties to the WLR Appeal, we made clear that matters arising from the LLU and WLR hearings would be treated as potentially relevant to and admissible in both cases.

Document disclosure issues

1.84 Over the course of the LLU and WLR Appeals, there have been a number of issues concerning disclosure of documents that have impacted upon our process.

1.85 Specifically, in relation to the WLR Appeal, we note that there was late disclosure of certain BT documents which had hitherto been withheld from all parties by BT as confidential and which the Tribunal requested us to review for relevance to our considerations, and which we ultimately identified as potentially relevant to the issues in the WLR Appeal. We were required to perform this analysis of numerous documents in a matter of days.

1.86 Complete disclosure of the relevant documents was not made to the parties until May 2010. This meant that the CC had to allow the parties time for further submissions on the disclosed documents. Final submissions were received on 1 June 2010.

1.87 The disclosure of these documents at a very late stage of the LLU and WLR Appeals has meant that an already long process has become even longer. Our involvement in the disclosure exercise has added to the workload of the CC and has required us to expend resource on matters that might better have been dealt with earlier in the LLU

---

[37] Letter from the Tribunal to Osborne Clarke dated 26 January 2010. CPW disagreed with the Tribunal's conclusions and responded setting out further arguments for consolidation in its letter of 27 January 2010.
[38] Letter from the CC to the Tribunal dated 29 January 2010.
[39] Letter from the Tribunal to Osborne Clarke dated 29 January 2010.
[40] The Tribunal confirmed that all documents served or disclosed in the WLR Appeal could be used for the purposes of the LLU Appeal in its communication to Osborne Clarke dated 3 February 2010.

and WLR Appeals process. This has also added to the time we have needed to complete the exercise we have been asked by the Tribunal to perform.

1.88 We also note that there were initial issues concerning CPW's access to Ofcom's confidential modelling (although these were resolved prior to the WLR Reference being made to the CC).

1.89 These issues have resulted in a large number of submissions being received from the parties months in to the LLU and WLR Appeals process. This has created an extra level of complexity to the appeal process.

1.90 It is our hope that in the future parties to Communications Act appeals will seek to identify and resolve disclosure issues earlier in the process, ideally prior to any reference being made to the CC.

Considering evidence

1.91 As in the LLU Appeal, there have been some instances where we have been provided with evidence and/or new arguments at a relatively advanced stage of the proceedings—for example, in relation to clarification we sought from CPW in respect of CPW's approach to the appropriate calculation of the structure of charges.

1.92 The complex nature of the issues raised in the WLR Appeal has required us to clarify certain matters with the parties and we are grateful for the responses to our information and data requests. Where we have received information at a relatively advanced stage of the proceedings, of necessity, we have needed to consider whether, in answering the WLR Reference Questions and given the time and resources available to us, it has been appropriate for us to consider every aspect of this information. This assessment has informed how much detail we have needed to go into when looking at some of the Frontier Economics (Frontier) material,[41] particularly where it appears to us that some of the numbers provided have been based on adjustments to the Ofcom modelling that were not raised by the arguments submitted in CPW's WLR NoA.

1.93 We explain further how we have analysed the various submissions from Frontier in our assessment section (see Section 3).

[41]We requested this information by letter on 19 April 2010. CPW's Solicitors, Osborne Clarke, responded on 27 April submitting a paper produced by Frontier. On 20 May Osborne Clarke submitted a piece of financial modelling prepared by Frontier; and some revisions to this modelling were submitted on 1 June.

Part 2: General and economic introduction

The WLR Appeal

1.94 On 18 February 2010, the Tribunal referred the following two questions to the CC in the WLR Appeal:

> **Question 1**
>
> Whether, for reasons set out within paragraphs 76 to 107 of the Notice of Appeal, the WLR Price Controls have been set at a level which is inappropriate because OFCOM failed to set the controls in such a way as to secure that the differential between, on the one hand, the price for WLR and/or WLR + SMPF and, on the other hand, MPF was at least equivalent to the long run incremental cost ("LRIC") difference between those services:
>
> (i) by reason of OFCOM setting the price differentials on a current cost accounting and fully allocated costs basis rather than on a LRIC basis, as explained, in particular in paragraphs 87 and 88 of the Notice of Appeal; or
>
> (ii) by reason of OFCOM having erred in its calculation of LRIC for the reasons set out in paragraphs 92 to 105 of the Notice of Appeal.
>
> **Question 2**
>
> Whether, for reasons set out within paragraphs 76 to 107 of the Notice of Appeal, the WLR Price Controls have been set at a level which is inappropriate because OFCOM should have, but did not, set those controls in such a way as to secure that the differential between on the one hand, the price for WLR and/or WLR + SMPF and, on the other hand, MPF was greater than the difference between the LRIC of those services.

1.95 This section provides some background to the issues arising in connection with the WLR Appeal. First, we summarize CPW's challenge. Then we set out an overview of the terminology and technological background relevant to the WLR Appeal.

Summary of CPW's challenge

1.96 CPW's challenge is made out in its WLR Notice of Appeal (WLR NoA) at §§76–107.

1.97 WLR Reference Question 1 concerns Ofcom's approach to calculating the WLR price controls. Specifically:

- §§87 and 88 of the WLR NoA concern Ofcom's approach of setting the price differentials on the basis of a current cost accounting and fully allocated costs basis rather than on a long run incremental cost (LRIC) basis.

- §§92–105 of the WLR NoA concern Ofcom's approach to determining the LRIC cost differential.

1.98 The main issues raised by Reference Question 1 are:

(a) In setting a price differential that is at least equivalent to LRIC—has Ofcom erred in principle by adopting an approach that used CCA FAC (Current Cost Accounting Fully Allocated Cost) and then applied a cross-check to a LRIC estimate? In other words, was Ofcom wrong to base the charges on a top-down allocation of all the costs in their most recent accounts to different services based, where appropriate, on the usage those services make of the cost elements, and then apply a check based on the costs of providing a certain quantity of each service over a long period calculated using the equipment required (bottom-up).

(b) Has Ofcom erred in its calculation of LRIC as a cross-check?

(i) Has Ofcom not based its assessment on efficient forward-looking costs, and in particular not applied the most efficient assumptions on the technology for line cards and MPF wiring?

(ii) Has Ofcom made practical errors in its calculations of LRIC estimates?

1.99 WLR Reference Question 2 concerns the appropriate approach to evaluating the differentials between the WLR and LLU price controls.

1.100 The main issues raised by Reference Question 2 are whether Ofcom should have set the WLR price controls at a level such that the differentials between:

- the price for WLR and the price for MPF; and
- the combined price for WLR and SMPF, and the price for MPF,

would be greater than the differences between the LRICs of those services.

Background to the issues

The relevance of the differentials between WLR and MPF services

1.101 MPF and WLR (with SMPF for broadband) are alternative ways to deliver voice, or voice and broadband, services to customers. Because CPW acquires MPF services from Openreach, CPW is concerned not only with the price of MPF in absolute terms, but also with the price differentials maintained between MPF and SMPF+WLR, and between MPF and WLR.

The importance of the 'mark-up'

1.102 The costs of the various services comprise many elements. Some of these are readily and uncontroversially attributable to one and only one service or set of services; these can be considered to be 'direct costs' although a variety of terminologies are used. Other costs are incurred as inputs to a wider group of services. When such costs are incurred, there are a variety of ways of allocating them across the services; adding these costs to the direct costs is sometimes described as a 'mark-up'.

1.103 Within the telecommunications industry there are many shared components. As a result the 'mark-up' figures can be a high proportion of the overall cost. Thus, the decisions as to how to allocate these costs become very significant.

Terminology

1.94 The WLR Appeal raises a number of complex economic issues. This part seeks to provide a general introduction to the key terms arising in the WLR Appeal.[42] We note that there is some variance in how different terms are used by the parties; the actual meaning depends upon the context, and we have considered the parties' arguments in context. The following explanations are therefore provided only for general guidance.

The notions of efficiency

1.95 The discussion involves three types of economic efficiency:

(a) *'Allocative efficiency'* is achieved when prices are close to marginal cost. This ensures that all consumers who value a product at more than its cost are able to purchase it.

(b) *'Productive efficiency'* means that the costs of production are minimized.

(c) *'Dynamic efficiency'* means that firms have the correct incentives to invest (eg in new infrastructure) and to innovate (eg to generate new products). Greater reliability and other quality improvements, and the creation of new products and services, are critically-linked to investment and innovation.

Ofcom's cross-check

1.96 Ofcom acknowledged that there was a risk that setting charges based on CCA FAC would mean that the difference between the price for MPF and that for WLR + SMPF would be less than the difference in LRICs between these services. This could have created productive inefficiency by encouraging production of voice and broadband services to shift towards using WLR+SMPF instead of using MPF for some operators that would have in fact minimized their total costs by continuing to use MPF. Ofcom conducted a brief cross-check to guard against a major productive inefficiency distortion while relying on the CCA FAC method to allocate all costs between products sensibly.

Background to the technology

1.97 Since the digitization of telephone networks, most fixed-line telephone calls in the UK have been carried on BT's legacy network. This network is a public switched telephone network (PSTN) and uses time division multiplexing (TDM). It is a circuit switched technology where a route is found to link two telephones or exchanges together for the entire call. This technology uses line cards to connect the core transmission network (that starts at the main distribution frame (MDF)) to the individual telephone line at the local exchange or subscriber unit.

1.98 More recently, next generation network (NGN) technology has been developed which can transmit telephone calls in the same way as Internet traffic using IP (Internet protocol) routers and packet switching, so that each transmission or telephone call is broken down into packets and then each packet is transmitted through the network separately and reassembled at the other end. Implementation of NGN can mean that separate core networks for distributing different types of data can be replaced with a

---

[42]Also see the Glossary.

single converged network for all data transmission. Customers are connected to the NGN using multi-service access nodes (MSANs) and line cards that can interact with both voice and data traffic called combi-cards. BT called its implementation of NGN 21CN (21st century network). CPW argued that Ofcom's price control should have been based on the costs of an NGN network because these costs were those that an efficient operator would have incurred.

1.99 Ofcom and BT said that the decision on whether NGN was the appropriate technology to adopt in the core network (and whether to change the line card in the access network to interact with an NGN network) was affected by the extent of next generation access (NGA) development. NGA is the provision of higher speed and capacity connections to customers' premises from the local exchange or subscriber unit by replacing the existing copper wires with fibre-optic cables. There are two main methods. FTTC (fibre to the cabinet) is where the copper wire from the local exchange to the street cabinet is replaced with fibre optic, but the customer still relies on a slower copper connection to link their premises to the cabinet (which may continue to dictate the capacity). FTTP (fibre to the premise) is where the fibre-optic cable is extended all the way to the customer's premises. As Internet usage has grown, CPs have found that customers are more willing to pay for higher-speed connections using FTTC and FTTP.

1.100 Table 1.1 shows the cost benchmarks for 2012/13 used by Ofcom to set the price controls for MPF, SMPF and WLR, and CPW's revised calculations. These figures show that CPW argued for lower MPF and SMPF charges and higher WLR charges, resulting in an increase in the differential between MPF and WLR from £10 to £36 per line and between MPF and WLR + SMPF from £25 to £47 per line.

TABLE 1.1 **Ofcom's price controls and CPW's revised figure (base method) for 2012/13**

	Ofcom CCA FAC	*CPW*
WLR—Residential	108	116
WLR—Business	104	115
MPF	98	80
SMPF	15	11

Source: WLR Statement and figures provided by CPW.

Section 2: WLR Appeal: Overview of the parties' arguments

Introduction

2.1 In broad summary, CPW's case was that[1] the price controls imposed on Openreach in respect of WLR were set at an inappropriate level because Ofcom had erred in setting the efficient price differential as between:

(a) MPF and WLR; and

(b) MPF and WLR+SMPF.

2.2 CPW challenged Ofcom's approach to setting price differences on the basis that:[2]

(a) the price differential certainly must not be less than the LRIC cost differential;

(b) there was a compelling argument for a differential as between MPF and WLR and MPF and WLR+SMPF which was greater than the LRIC differences between those respective services—ie some form of mark-up over LRIC (LRIC+EPMU); and

(c) specifically, CPW alleged that Ofcom had erred in three key issues:

(i) Ofcom failed to have regard to the need for a price differential that equalled or exceeded the LRIC cost differential between MPF and WLR;

(ii) Ofcom failed to properly take into account the economic principles that underpinned an economically efficient and appropriate price; and

(iii) in any event, Ofcom miscalculated LRIC in its 'cross-check'.

2.3 Mr Heaney suggested[3] that to calculate the forward-looking cost differences between MPF and WLR (and also between MPF and WLR+SMPF) to maximize economic efficiency, the cost standard should be:

(a) Based on costs in 2012/13.

(b) Based on a long-run view of incremental costs considering which costs are variable over the long run including fixed assets and other one-off costs such as the costs of implementing new technologies.

(c) Forward looking in that it was based on the activities and assets that would be incurred to efficiently deliver the services in future rather than being based on the activities and assets currently being used to deliver the service.

(d) Based on the modern efficient asset (MEA) in that it assumes that the technology /architecture was the most cost efficient (on a forward-looking basis.) This has several implications:

(iv) The MEA was based on NGN technology and not BT's existing PSTN network technology.

---

[1] CPW WLR NoA, §7.
[2] CPW WLR NoA, §78.
[3] CPW W/S Heaney I, §222.

(v) Migrating to NGN will require installation of new equipment and also the physical migration of customers from the existing network to the new NGN. Thus the MEA should include these costs.

(vi) The MEA cost should be based on the efficient migration approach and timing and thus should not be explicitly linked to BT's 21CN roll-out programme.

(e) Costs are based on BT's additional costs for providing WLR instead of MPF or WLR+SMPF instead of MPF, and not on a new entrant, such as CPW. This was consistent with the approach appropriate for reducing productive inefficiencies.

Pleadings and witness statements

2.4 On 23 December 2009 CPW appealed Ofcom's WLR decision (*Charge controls for Wholesale Line Rental and related services*, dated 26 October 2009) (the WLR Statement). The WLR Statement imposed charge controls on Openreach in respect of WLR and associated ancillary services. CPW had already[4] appealed a related price control decision of Ofcom's concerning charge controls on Openreach in respect of MPF, SMPF and associated ancillary services.[5]

2.5 In this section, we consider relevant parts of both the WLR Statement and LLU Statement, as the context requires.

2.6 Table 2.1 below sets out the key pleadings and witness statements in which the parties set out their arguments in the WLR Appeal.

TABLE 2.1 **WLR Appeal: pleadings and witness statements**

Party	*Pleading*	*Witness statements**
CPW	Notice of Appeal dated 23 December 2009	Heaney III Houpis III
	Reply V dated 29 March 2010	Heaney VII Houpis VI
	Reply VI dated 21 May 2010	
Ofcom	Defence dated 15 February 2010	
BT	Statement of Intervention dated 26 February 2010	Peard II Dolling III Shurmer III

Source: CC.

*CPW submitted additional witness statements from some of its witnesses in respect of the non-price control matters in the LLU and WLR Appeals, as well as in respect of interlocutory proceedings. Hence the numbering of the CPW witness statements does not always run sequentially for each 'pleading'.

2.7 In addition to the pleadings and witness statements, we held hearings with the parties, received correspondence on specific points (including correspondence from the parties commenting on the transcripts of the various hearings), and received submissions from Frontier on behalf of CPW. We also issued a provisional determination to the parties to the WLR Appeal on 8 July 2010 regarding which the parties made written submissions. We gave careful consideration to these submissions and consider specific points made in these submissions in Section 3 of this determination.

[4] By way of a Notice of Appeal dated 21 July 2009 (the LLU Appeal).
[5] *A New Pricing Framework for Openreach*, dated 22 May 2009 (the LLU Statement).

The LLU Appeal

2.8 We also considered the pleadings, witness statements and evidence submitted in the LLU Appeal. By the Tribunal's direction of 26 January 2010 all documents served or disclosed in the LLU Appeal may be used for the purposes of the WLR Appeal. The Tribunal made a similar direction on 3 February 2010 so that all documents served or disclosed in the WLR Appeal may be used for the purposes of the LLU Appeal.

2.9 Table 2.2 below sets out the key pleadings and witness statements in which the parties set out their arguments in the LLU Appeal in relation to Question 1(iv) of the LLU Reference. Question 1(iv) of the LLU Reference concerned the allocation of costs as between MPF on the one hand and WLR and SMPF on the other.

TABLE 2.2 **LLU Appeal: pleadings and witness statements in relation to Question 1(iv) of the LLU Reference**

Party	*Pleading*	*Witness statements*
CPW	Original Notice of Appeal dated 21 July 2009	Heaney I Houpis I
	Amended Notice of Appeal dated 17 December 2009	
	Reply I dated 22 January 2010	Heaney IV Houpis IV
	Reply II dated 9 February 2010	Heaney V
Ofcom	Original Defence dated 26 October 2009	
	Amended Defence dated 8 January 2010	
BT	Original Statement of Intervention dated 10 November 2009	Dolling I Tickel I
	Amended Statement of Intervention dated 5 February 2010	
Sky	Original Statement of Intervention dated 6 November 2009	Bushell I
	Amended Statement of Intervention dated 5 February 2010	

Source: CC.

*CPW submitted a third 'reply' dated 1 March 2010 in respect of the LLU Appeal.
†CPW submitted a fourth 'reply' dated 8 March 2010 in respect of the non-price control matters in the LLU Appeal.

2.10 The remainder of this section is structured as follows:

(a) First, we consider the arguments around whether Ofcom failed to secure that the differential between the price for MPF and WLR+SMPF was at least equivalent to the LRIC difference between those services.

(b) Secondly, we consider the arguments around whether Ofcom failed to secure that the differential between the price for MPF and WLR was at least equivalent to the LRIC difference between those services.

(c) Thirdly, we consider the arguments around calculating the price differentials on a current cost accounting and fully allocated cost basis rather than on a LRIC basis.

(d) Fourthly, we consider the arguments regarding the relevant technological assumptions in setting the price differentials and whether Ofcom erred in its calculation of LRIC.

The differential for MPF and WLR+SMPF

Ofcom's Decision[6]

2.11 In its WLR Statement, Ofcom considered[7] that the differential between MPF and WLR+SMPF should reflect cost differences because of the risks of distorting the choice of wholesale products. Ofcom did not[8] consider it appropriate to base charges on demand-based factors (for example, by using Ramsey pricing) as MPF and SMPF+WLR were alternative wholesale inputs for CPs to provide the same retail services.

2.12 Ofcom said[9] that setting charges so that the differentials broadly reflected incremental cost differences would be consistent with removing any productive efficiency distortions and that setting charges on the basis of CCA FAC was consistent with achieving this aim.

2.13 In its LLU Statement, Ofcom stated that when setting charges it had considered two, potentially conflicting, considerations:[10]

(a) allocative efficiency considerations, to the extent that the wholesale products related to different retail markets; and

(b) productive efficiency considerations, to the extent that the wholesale products were alternative inputs for the same retail markets.

2.14 Ofcom stated[11] that the allocative efficiency considerations tended to point to mark-ups on LRIC that reflected differences in the elasticities of the different retail products; whereas the productive efficiency consideration tended to point towards charges which reflected the absolute differences in LRIC so that, if an operator chose to use WLR+SMPF instead of MPF, the higher charge it paid reflected the extra costs incurred as a result.

2.15 Ofcom said that the most important static efficiency consideration was the potential distortion in the use of wholesale products.[12] In general, where wholesale products were close substitutes, the choice between them could be distorted if the difference in charges did not reflect the difference in incremental costs. In the case of MPF and WLR+SMPF, these products were not in the same market, but were alternative wholesale inputs in the sense that either WLR+SMPF or MPF plus an LLU operator's own voice platform could be used as wholesale inputs to provide retail voice and broadband services.

2.16 If the MPF charge made a significantly lower contribution to recovery of common costs than WLR+SMPF, this would create distortions that would reduce efficiency.[13] For example, for LLU operators to choose between MPF and WLR+SMPF on their merits, the difference in charges should be comparable to the differences in incremental costs for Openreach. Ofcom considered that the potential distortions to competition in the longer term could be significant. Such distortions were, in its opinion, likely to be the most important static efficiency consideration. Ofcom con-

---

[6]This section summarizes both the LLU and WLR Statements.
[7]WLR Statement, §5.14.
[8]WLR Statement, §5.14.
[9]WLR Statement, §5.14.
[10]LLU Statement, §A4.27.
[11]LLU Statement, §A4.28.
[12]LLU Statement, §A4.8.
[13]LLU Statement, §A4.9.

sidered that charging on the basis of CCA FAC was likely to be broadly consistent with removing these static distortions.

2.17 In terms of dynamic efficiency, Ofcom considered whether it was justifiable to actively promote competition by setting prices specifically to assist entry with the use of MPF rather than WLR+SMPF.[14] Ofcom concluded that at this stage in the market's development differences between charges should move towards reflecting the underlying differences in costs.[15]

2.18 Ofcom agreed[16] that if deeper competition in voice (based on MPF) were to be effective and sustainable, it would be likely to lead to greater consumer benefits than otherwise. It said:

> In our on-going review of the retail narrowband services market, our provisional finding is that BT does not have SMP in the retail narrowband market. The scope for deeper competition in voice to produce dynamic gains is, therefore, likely to be limited. Any gains would be limited to the additional competition on the difference between the WLR and MPF cost stacks, over and above that provided by cable and that which would anyway be provided by MPF used for both voice and broadband. The majority of the 24 million lines take both voice and broadband.

2.19 Ofcom also said[17] that if there were significant benefits for CPs of moving to using MPF, then it would expect them to move to using MPF when it was most efficient for them to do so. There should be no need to artificially set prices to give them such an incentive. Maintaining an artificially high differential between MPF and WLR+SMPF might encourage operators to make the transition earlier than would be efficient.

2.20 Ofcom said that CPW's approach would 'tend to disadvantage operators using WLR+SMPF' and, as a result, could 'conceivably reduce competitive pressures for broadband services'.[18]

2.21 In its WLR Statement, Ofcom calculated[19] the LRIC differential between MPF and WLR+SMPF to be in the range of £15 to £20, compared with a forecast difference in CCA FAC used to set the glide path for prices of around £25 in 2012/13. As such, Ofcom said that it was confident that the difference between the MPF and WLR+SMPF charges was certainly not smaller than the LRIC differentials.

CPW's Appeal[20]

2.22 CPW suggested[21] that the most efficient pricing differential depended on whether one was considering productive, allocative or dynamic efficiency. CPW argued that:

---

[14]Ofcom explained at its bilateral hearing (p26, lines 17–27) that to promote network-based competition using MPF and SMPF it put in place a floor on the price that BT could charge for wholesale products. However, Ofcom had always envisaged that this would come to an end at a point when new entrants were able to gain sufficient scale to stand on their own feet.
[15]LLU Statement, §A4.10.
[16]LLU Statement, §A4.89.
[17]WLR Statement, §A4.95.
[18]Ofcom LLU Statement, §A4.94.
[19]WLR Statement, §5.86.
[20]This section summarizes both the LLU and WLR NoAs. We note that CPW's WLR NoA largely replicated and expanded upon CPW LLU NoA.
[21]CPW WLR NoA, §82.

(a) Optimization of productive efficiency would require the difference in prices between MPF and WLR+SMPF to reflect the difference in incremental costs between those services.[22]

(b) Optimization of allocative efficiency would require fixed and common costs to be recovered with regard to the relative demand characteristics of the products.

(c) Optimization of dynamic efficiency considerations required that providers were incentivized to use the technology (which CPW argued to be MPF) that would tend to encourage stronger and deeper network-based long-term competition.

2.23 Dr Houpis[23] stated that the set of prices that would maximize allocative and productive efficiency were the relevant Ramsey prices. Prices based on FAC, as adopted by Ofcom, did not take account of demand considerations but rather allocated common costs to services as an accounting exercise.

2.24 CPW accepted that whether CPs would switch between WLR+SMPF and MPF products in response to price changes was a relevant consideration. In particular, in response to Ofcom's claim that where two wholesale products were substitutes there were limitations in the applicability of Ramsey pricing to derive an efficient set of charges, CPW said that Ramsey pricing could be applied in these circumstances using super elasticities of demand:[24]

> Ramsey pricing should therefore, in principle, and if correctly calculated, take into account cross price elasticities by incorporating these within what is known as the super-elasticity of the product. In this way substitution between two or more products as relative price level change is incorporated within the welfare analysis.

2.25 Ramsey pricing implied that, if the demand for voice services was more inelastic than the demand for broadband, MPF should make a relatively smaller contribution to the recovery of any fixed and common costs than WLR, to the extent that MPF was used to provide predominantly broadband services.[25]

2.26 CPW said that it had provided evidence to Ofcom in response to Ofcom's Second Consultation that showed that the demand for voice services was relatively more inelastic than the demand for broadband services. CPW said that this evidence suggested that an efficient set of prices should recover more fixed and common costs from voice services.[26]

2.27 While Dr Houpis[27] shared Ofcom's view that the elasticity evidence was not ideal and additional evidence would be useful in arriving at a more definite view, he argued that the available evidence supported the view that there was a significantly higher demand elasticity for broadband compared with voice services because:

[22] Dr Houpis argued that ensuring that there was no distortion resulting solely from productive inefficiencies would require the difference in prices for MPF and WLR+SPMF to equal the difference in the LRIC of providing MPF and WLR+SPMF (see CPW W/S Houpis I, §26).
[23] CPW W/S Houpis I, §51.
[24] CPW W/S Houpis I, §54.
[25] CPW W/S Houpis I, §55.
[26] CPW W/S Houpis I, §56.
[27] CPW W/S Houpis I, §§57 & 58.

(a) The evidence presented indicated a higher sensitivity of demand in relation to the price of broadband than voice services.[28] Dr Houpis argued that Ofcom did not provide any evidence that suggested otherwise.

(b) While the evidence presented was not up to date, no evidence had been presented to suggest that the relative price sensitivities of demand for broadband and voice had narrowed over time.

(c) Whilst broadband prices had fallen over time, later adopters of broadband could be more price sensitive than earlier adopters.

(d) Demand for MPF would be relatively more elastic than demand for WLR because demand for MPF was predominantly driven by broadband, whereas demand for WLR was still driven by demand for voice services.[29]

(e) Dr Houpis was not aware of any evidence to suggest that the relative price sensitivities of the demand for broadband and voice at the retail level would be reversed at the wholesale level.[30]

2.28 In Dr Houpis's view, all these factors demonstrated the importance of choosing a structure of prices that at least goes some way to more closely reflect an efficient structure of prices than those prices based on an unadjusted application of CCA FAC.

2.29 Dr Houpis suggested[31] that higher demand elasticity for broadband compared with voice services did not necessitate the implementation in practice of a full (or optimal) Ramsey approach (given significant practical challenges), but required the differential between MPF and WLR prices to be larger than the difference in LRICs.

2.30 Dr Houpis considered[32] that even if elasticities of demand for MPF and WLR were the same, if prices of MPF and WLR were set to reflect no more than the absolute difference in the incremental costs of MPF and WLR, this would 'unambiguously' lead to allocative inefficiencies. Dr Houpis argued that this was because if the price sensitivities of demand for MPF and WLR were the same, allocative efficiency required that the prices of WLR and MPF were set such that the mark-up over incremental cost for each service to recover any fixed and common costs between WLR and MPF was proportional to the incremental cost of each service. In other words, to maximize allocative efficiency, the difference in prices should equal the true LRIC of each service plus equal proportionate mark-up (EPMU).

2.31 CPW considered[33] that Ofcom's proposals implied a constant mark-up per line in absolute terms, not in proportion to the LRIC. Therefore, Ofcom's approach would imply that MPF (with a lower LRIC) would be making proportionately a larger contribution to the recovery of fixed and common costs than WLR.

2.32 CPW argued[34] that setting the price of any wholesale products too high allowed BT to engage in a price squeeze, since it could use excess revenues derived from wholesale products to compete more keenly in the retail market. Furthermore, setting

[28] CPW stated that it provided evidence on demand elasticities for voice and broadband services in its responses to the first and second Ofcom consultation documents. This evidence showed that the demand for voice services was relatively more inelastic than the demand for broadband services.
[29] CPW W/S Houpis I, §59.
[30] CPW W/S Houpis I, §59.
[31] CPW W/S Houpis I, §60.
[32] CPW W/S Houpis I, §61.
[33] CPW W/S Houpis I, §62.
[34] CPW WLR NoA, §79.

the price of MPF too high relative to WLR (for voice) and too high relative to WLR+SMPF (for voice and broadband) prejudiced the ability of those using MPF to compete effectively and sustainably against those purchasing WLR or WLR+SMPF from BT.

2.33 CPW also argued[35] that capping the price of WLR at an inappropriately low level could create a competitive distortion in relation to other technologies, such as mobile, that were seeking to compete with fixed in the provision of voice services to the low usage segment.

2.34 CPW argued[36] that the levels of MPF, SMPF and WLR, and the structure of relative prices between MPF and WLR, and also between MPF and WLR+SMPF, were critical to effective network-based competition.

2.35 Mr Heaney argued[37] that network-based competition was of particular importance because it allowed competitors to innovate and differentiate by services, which was only possible if competitors operated their own network, leading to substantial benefits for consumers. In CPW's view, Ofcom had argued[38] that setting a price for MPF too high relative to WLR (or relative to WLR+SMPF) would discourage effective and sustainable deep network-based competition.

2.36 CPW defined dynamic efficiency benefits as relating to long-run developments in the market that ultimately serve to the benefit of the consumer. Dr Houpis considered[39] Ofcom's assessment of dynamic efficiencies encompassed a number of shortcomings, specifically:

(a) an understatement of the potential benefits from increased competition and, in particular, confusion between promoting effective competition and protecting inefficient competition;

(b) a failure to identify the circumstances under which dynamic and static efficiency considerations may differ;

(c) a failure to appreciate the implications for dynamic efficiency of reducing the differential in prices between MPF and WLR+SMPF, and MPF and WLR, because of its erroneous assessment of prices that satisfied allocative and productive efficiency; and

(d) its justification for the use of inaccurate cost estimates to set the price of core rental services (CRS) on the grounds of promoting regulatory stability.

2.37 CPW dismissed Ofcom's concern that its approach would 'tend to disadvantage operators using WLR+SMPF' and, as a result, could 'conceivably reduce competitive pressures for broadband services'[40] and said[41] that SMPF-based competition had been the major platform in 2004, but technology had moved on significantly in the last five years, which needed to be reflected in the pricing structure. CPW also said that such concerns would only be an issue if new entry was still possible, and if it was important to preserve the opportunities for stepped entry (as described by BT).

---

[35] CPW Heaney III, §32.
[36] CPW WLR NoA, §79.
[37] CPW W/S Heaney I, §§20–25.
[38] CPW WLR NoA, §81.
[39] CPW W/S Houpis I, §69.
[40] Ofcom LLU Statement, §A4.94.
[41] CPW hearing transcript, p31, lines 8–18.

2.38 CPW also argued that:[42]

(a) According to Ofcom projections, whilst (non-BT) SMPF lines accounted for a majority of (non-BT) SMPF and MPF lines in 2009/10, this would be reversed by 2012/13.

(b) Ofcom confused the dynamic role that competition could have in promoting efficiency with seeking to protect the specific firms currently competing in the market.

(c) Ofcom did not present any evidence that there would be fewer competitors, or less intense competition to provide services over MPF than over WLR+SMPF, only that, given the historic pricing pattern, relatively more customers were served today using the latter.

(d) There was no convincing argument that the cost structure of operators competing using MPF should be such as to create additional barriers to entry, or other obstructions to competition, which would reduce the intensity of competition between operators.

2.39 Contrary to Ofcom's assessment of the benefits of dynamic efficiencies in voice services, CPW noted[43] that as a result of using MPF rather than WLR+SMPF there had been significant innovation, including the bundling of voice with broadband, free voicemail and a range of additional voice features combined with innovative price plans.

2.40 CPW said that Ofcom argued that its approach had advantages in terms of dynamic efficiency stemming from transparency, predictability and consistency for competitors.[44] CPW disagreed,[45] explaining that there was a serious lack of transparency in the process by which prices were set; and that Ofcom's argument placed undue weight on avoiding change or development, both over time, and across all Ofcom's regulatory decisions. CPW said that, whilst it might be desirable to set the recovery of overall costs in a fashion that did not allow large categories of costs not to be recovered (or to be double-recovered), this did not mean that price differentials between specific services should be set on this basis simply because that was how they had been set in the past or in some other price contexts.

2.41 CPW argued[46] that the key issue in relation to cost recovery was that Openreach (and investors in Openreach) should expect that prices would be set so that Openreach recovered its overall costs, based on the best available information at the time prices were set. This required that the relevant expected revenues of Openreach recovered its projected costs, rather than assuring investors that costs would be recovered under any variation in demand for Openreach's products.

2.42 While Ofcom had taken into account overall efficiency gains in the provision of the CRS, Dr Houpis stated[47] that no allowance had been made for potentially differing rates of efficiency gains between MPF and WLR (due to probable changes in how these services could be expected to be delivered over the forecast period), for example the introduction of new products (such as single jumpering) would reduce the true incremental cost of MPF.

[42]CPW W/S Houpis W/S I, §§77–81.
[43]CPW W/S Houpis I, §71.
[44]Ofcom Defence, Annex, §§40 & 41.
[45]CPW Reply I, §145.
[46]CPW Reply I, §146.
[47]CPW W/S Houpis I, §31.

2.43 CPW argued that Ofcom had overstated the degree of substitution between MPF and WLR/WLR+SMPF. In particular, CPW said that[48] although over the longer term it was reasonable to expect a strong relationship between the price differential between MPF and WLR+SMPF and an operator's choice of wholesale product, such decisions would be influenced in the short term by factors other than just price, including the overall business strategy of an operator and the costs of migrating customers to a different technology, which were significant.

Ofcom's Defence[49]

2.44 Ofcom concluded[50] that productive efficiency was the more important consideration in the balancing of allocative and productive efficiency. Charges should therefore be set so that the differential in prices between MPF and WLR/SMPF was broadly in line with differences in the LRICs of these products. Ofcom stated[51] that it was generally to be expected that the difference between charges which have been set on a CCA FAC basis would be at least as great as the difference between the LRICs of the services in question, since CCA FAC was a form of LRIC plus mark-up (for common costs).

2.45 Ofcom[52] did not accept that there was a strong case for setting a larger differential than LRIC (as suggested by CPW):

(a) When allocative and productive efficiency were considered together, they did not suggest that the differential between the charges for MPF and for WLR+SMPF should be significantly greater than the difference in the respective LRICs.

(b) Based on an assessment of allocative, productive and dynamic efficiency considerations, Ofcom found[53] that the differentials resulting from the charges set on a CCA FAC basis were appropriate.

2.46 Ofcom took the view[54] that the most important static efficiency consideration was productive efficiency, and this should be given a higher weight, especially in the longer term. Ofcom noted that MPF was currently used exclusively for the delivery of voice and broadband and MPF and WLR+SMPF was therefore currently alternative wholesale inputs for the same retail products.

2.47 On its own, Ofcom stated[55] that productive efficiency would imply a price differential equal to the difference in the LRICs of the inputs. In theory, Ofcom could have sought to optimize economic efficiency, giving some weight to allocative efficiency, in setting the differentials. This may suggest a move over time towards a differential that was close to the difference in LRIC, as substitution would increase over time. When two inputs were substitutes, Ofcom noted that the theory implied that their relative prices should be set to reflect their relative marginal costs.[56]

2.48 In practice, Ofcom[57] said that there were severe measurement difficulties and as such it did not consider it feasible to try to optimize economic efficiency in a very

[48] CPW W/S Houpis I, §49.
[49] This section incorporates both Ofcom's LLU and WLR Defence.
[50] Ofcom LLU Defence, Annex D, §48.
[51] Ofcom WLR Defence, Annex §16.
[52] Ofcom LLU Defence, Annex D, §6.
[53] Ofcom WLR Defence, Annex, §6.
[54] Ofcom LLU Defence, Annex D, §9.
[55] Ofcom LLU Defence, Annex D, §23.
[56] Ofcom LLU Defence, Annex D, §17.
[57] Ofcom LLU Defence, Annex D, §25.

precise way. There were measurement difficulties in assessing LRIC and in assessing the elasticity of demand for access for MPF and WLR+SMPF and substitution between them. Ofcom also suggested that if it chose to set optimal prices for MPF, WLR and SMPF, it would be necessary to set all regulated charges to a fully optimal basis. This could require a recalculation of the common cost allocation for other services, including the network charge control.

2.49 Ofcom did not believe[58] that Ramsey mark-ups could be used to set MPF and WLR+SMPF charges to achieve efficient overall recovery of costs. It considered the informational requirements of Ramsey pricing to be prohibitive. It would not be feasible to rely on Ramsey mark-ups because of the risk of distorting the choice (in terms of productive efficiency) between WLR+SMPF and MPF.

2.50 Given the various measurement difficulties, Ofcom[59] took the view that the best that could realistically be achieved in terms of economic efficiency was to ensure that the differential between MPF and WLR/WLR+SMPF was sufficiently reflective of Ofcom's estimate of the likely range for LRICs.

2.51 In response to Dr Houpis's suggestion that developments in the theory of Ramsey pricing would allow Ofcom to set prices taking into account of both productive and allocative inefficiency at the same time using the 'super elasticity' of the product, Ofcom[60] referred to *The Access Pricing Problem: A Synthesis* by Mark Armstrong, Chris Doyle and John Vickers (ADV) as an alternative approach to calculate the optimal access price. The ADV model was composed of the marginal cost of the input; an 'Efficient Component Pricing Rule' (ECPR) term; and a 'Ramsey' term.

2.52 Ofcom noted[61] that the ADV model was concerned with static efficiency. Ofcom considered that considerable weight should be placed on dynamic efficiency and therefore did not set charges using the ECPR.

2.53 Ofcom considered[62] that the differential in charges between MPF and WLR+SMPF did affect relative demands because it would affect CPs' choice of wholesale products, and because the wholesale demands may be affected through the retail market as end-consumers switched between CPs.

2.54 Ofcom suggested[63] that to the extent that substitution was restricted, this would be due to inertia and a delay in responding to price signals. The less than full substitutability derived from obstacles to switching which were likely to disappear over time. In technical terms, Ofcom expected the long-run elasticity of substitution to be significantly higher than the short-run elasticity. If this were so, the optimum prices would change over time. However, it would be difficult to track the changes in the elasticity over time and to adjust prices to reflect this.

2.55 Ofcom argued[64] that the relationship between input price differentials and substitutability would have to be stable, continuous and known over time to allow the approach advocated by CPW to be feasible. As the relationship was likely to be none of these, and attempts to implement an approach of the type suggested would be likely to be unsuccessful, possibly leading to unstable and unintended outcomes, Ofcom disagreed with CPW's approach.

---

[58] Ofcom LLU Defence, Annex D, §16.
[59] Ofcom LLU Defence, Annex D, §28.
[60] Ofcom LLU Defence, Annex D, §§10–15.
[61] Ofcom LLU Defence, Annex D, §§14 & 15.
[62] Ofcom LLU Defence, Annex D, §19.
[63] Ofcom LLU Defence, Annex D, §§20 & 21.
[64] Ofcom LLU Defence, Annex D, §22.

2.56 Ofcom considered[65] that CPW overstated the difference in elasticity between MPF and WLR of demand partly because it was possible that some demand for WLR was driven by retail demand for broadband Internet access.

2.57 Ofcom did not accept Dr Houpis's assertion that dynamic efficiency considerations pointed to a differential significantly greater than the difference in the respective LRICs.[66] Ofcom argued that it had considered the following aspects of dynamic efficiency when making its charging decisions:

(a) potential gains from increased competition in broadband and voice; and

(b) providing a stable regulatory framework, including by giving weight to how charges had been set in the past and to stakeholders' reasonable expectations for charges in the future, so as to enable a climate for efficient investment.

2.58 Ofcom[67] said that a reasonably priced WLR product was important to downstream competition. Ofcom had now deregulated the retail narrowband market and a significant increase in the WLR charge could affect the competitive conditions in the retail market.

2.59 Ofcom said[68] that its view was that sustainable and effective competition required that—in the long term—entrants must be able to compete without special protection. This suggested that prices should be set in the longer term to cover efficiently incurred costs, and that relative prices should not distort the choices among products made by CPs.

2.60 Although there could be a case for a larger increase in MPF charges to reflect the difference in LRICs more closely, Ofcom suggested[69] that the glide path appropriately balanced the objective of reducing any potential distortion to choice between MPF and WLR+SMPF with the need to protect consumers and to avoid dislocation in the market. Ofcom did not agree[70] with CPW that there was a strong case for setting charges so as to generate a larger differential in order to promote competition. Other dynamic efficiency considerations militated in favour of retaining a CCA FAC approach, with an appropriate price path.

2.61 Ofcom said that another problem with attempting to set optimal prices for MPF, WLR and SMPF was that the analysis could only be partial as Ofcom had not set other prices in this way. Ofcom gave as an example the retail provision of calls which shared some common costs with access products. Ofcom said that calls generally had a higher elasticity than access products, so mark-ups on access products would have to reflect the lower elasticity of access prices compared with call prices. This could require a recalculation of the common cost allocation in the Network Charge Control in order to reduce mark-ups on calls.[71]

2.62 Ofcom[72] argued that CPW's suggestion of a margin squeeze was entirely hypothetical and that CPW did not provide evidence to support this claim.

[65] Ofcom LLU Defence, Annex D, §26.
[66] Ofcom LLU Defence, Annex D, §36.
[67] Ofcom LLU Defence, Annex D, §32.
[68] Ofcom LLU Defence, Annex D, §37.
[69] Ofcom LLU Defence, Annex D, §49.
[70] Ofcom LLU Defence, Annex D, §49.
[71] Ofcom LLU Defence, Annex D, §27.
[72] Ofcom WLR Defence, Annex, §50.

Sky's Intervention

2.63 Sky supported[73] CPW's submission that Ofcom's decision resulted in an insufficient difference between the prices of MPF and SMPF+WLR. Sky noted that although Ofcom's duty and stated policy objective implied that it should be promoting the use of MPF services, since competition based on using MPF was the most efficient means of competing, the most upstream form of competition that was sustainable in the short to medium term and it delivered the greatest benefits for consumers. Sky claimed that, in practice, Ofcom's decision would deter or slow down the future development of MPF-based competition and favour the incumbent provider.

2.64 Ms Bushell noted that Sky had historically purchased SMPF services, in conjunction with WLR services, but had recently made the decision to switch to using MPF services for both its existing and new subscribers who took broadband, calls and line rental services from Sky. The decision to switch was based on two main factors:

(a) the reduced cost and increased call termination revenues associated with purchasing MPF services compared with SMPF and WLR services; and

(b) the ability to offer an enhanced telephony proposition to its customers.

2.65 Ms Bushell indicated[74] that there were two key benefits of LLU services, over other wholesale services, offered by Openreach or BT Wholesale:

(a) although LLU involved relatively high upfront costs, CPs were able to benefit from lower ongoing costs compared with using other wholesale services, leading to lower prices for consumers; and

(b) because LLU involved the alternative CP effectively taking over the line between the local exchange and the customer's premises, it provided much greater scope for product differentiation and innovation compared with other wholesale services, as well as the ability for the service provider to control and deliver to the customer a better quality of broadband product and service.

2.66 Ms Bushell noted[75] that the benefit of LLU-based competition had been clearly recognized by Ofcom. In its last strategic review of the telecommunications sector, Ofcom concluded that, at least in the medium term, it was unlikely that further end-to-end infrastructure-based competition would be sustainable and that purely service-based competition would be insufficient to deliver the full range that benefited consumers. The most effective way of delivering these consumer benefits was seen to be through competition from alternative CPs at the deepest level of infrastructure (ie the most upstream level) where it was likely to be effective and sustainable, notably LLU-based competition. Although Ofcom did not appear to have moved away from this overall policy objective, Ofcom's decision did potentially reduce the scope for LLU-based competition to continue to deliver the full range of benefits originally envisaged by Ofcom and for these benefits to be rolled out to a larger number of customers in the future.

2.67 Ms Bushell indicated[76] that Sky made the decision to migrate to MPF services prior to publication of the LLU Statement, and noted that the decision was worse than Sky

[73] Sky LLU SoI, §34.
[74] Sky W/S Bushell, §19.
[75] Sky W/S Bushell, §20.
[76] Sky W/S Bushell, §28.

had forecast in its business case. Sky was clear that Ofcom's decision on MPF would be a key factor in its decision to invest in the future, [✂].[77]

2.68 Ms Bushell suggested[78] that Ofcom's decision would favour BT's retail business over other competing CPs, such as Sky, and that this would go against the objective of LLU which was introduced in order to increase, rather than decrease, the competitive pressure on BT.

BT's Intervention

2.69 With regard to CPW's claim of a potential margin squeeze, BT argued[79] that the cases presented by Mr Heaney were not relevant to the issue of the MPF and WLR+SMPF price differential as CPW and other MPF-based providers were not actively seeking to compete in the provision of either WLR or SMPF services, but in markets further downstream of MPF, SMPF or WLR.

2.70 Mr Shurmer said[80] that there was no risk of a price squeeze as was suggested by CPW, because of the legal and regulatory controls to which Openreach was subject, including accounting separation and the BT Undertakings. Mr Shurmer said[81] that CPW had ignored the fact that BT's Undertakings ensured that Openreach had the incentive to treat all its CP customers equivalently and impose legally binding obligations to reinforce those incentives.

2.71 BT argued[82] that SMPF-based provision had made a significant contribution to competition. BT said that, in particular, it had allowed CPs to enter the broadband market and build a customer base via bitstream, then move up the value chain to invest in providing SMPF services, and then to broaden their scope of provision into narrowband by taking WLR and offering bundled services. BT said that, at that point, LLU providers might seek to utilize MPF.

2.72 BT said that Mr Heaney referred[83] to innovation and choice, but did not reflect the importance of WLR in also providing these benefits to consumers. For example, a WLR-based CP which used carrier pre-selection (CPS)[84] to deliver voice calls, could do so over its own network using its own call servers and other telephony functionality, and was therefore able to innovate in terms of both infrastructure and service. Such benefits were not therefore confined to MPF, although an MPF operator may have more scope for innovation across a broader range of services than by using WLR alone.

2.73 Mr Shurmer noted[85] that there were also consumer benefits to WLR-based competition (alongside the use of SMPF) which MPF did not currently offer. For example, WLR allowed end-users to elect to take their voice and broadband services from different providers. SMPF allowed CPs to provide broadband independently of voice telephony. In contrast, MPF was used to provide 'bundled' broadband and telephony services from the same CP.

[77] Sky W/S Bushell, §§33–36.
[78] Sky W/S Bushell, §38.
[79] BT W/S Tickel, §21.
[80] BT W/S Shurmer III, §§34–37.
[81] BT W/S Shurmer III, §§33–35.
[82] BT W/S Tickel I §19.
[83] BT W/S Shurmer III, §23.
[84] CPS allows end-users to choose a supplier of voice calls without having to dial additional codes on the telephone. The regulated BT CPS product ensures that the end-users' calls are routed across the network of that supplier.
[85] BT W/S Shurmer III, §24.

CPW's Reply V (29 March)

2.74 In its LLU Defence, Ofcom had stated that the substitutability between MPF and WLR+SMPF for the provision of voice and broadband services would mean that any effort to increase the differential between MPF and WLR to take into account allocative efficiency considerations would be ineffective. In response, Dr Houpis[86] argued that there was no evidence that MPF and WLR+SMPF were very close substitutes. On the contrary, the available evidence on the demand for WLR, and WLR+SMPF, suggested that the two products were not perfect, or even near perfect, substitutes. He also said that there was also no evidence to suggest that this should be expected to change in the near future. In the absence of close substitutability, allocative efficiency considerations were even more important.

2.75 In support of his position, Dr Houpis said:[87]

(a) The provision of retail broadband and voice services using MPF offered greater flexibility in terms of the range of services that could be offered compared with the provision of similar services using WLR+SMPF.

(b) The provision of retail voice services using MPF relied less heavily on the inputs provided by BT/Openreach compared with WLR.

(c) There were also (sunk) transition costs of around £40 for customers that switched from one technology to another, which would imply that substitutability would be far from perfect at the margin.

(d) As the CP's capital costs to provide retail services using MPF, or WLR+SMPF, were to a significant extent sunk, this would also be expected to reduce the substitutability of MPF for WLR+SMPF for existing customers.

(e) The available empirical evidence was also consistent with the above analysis about the differences in the characteristics of the two products, as CPs used both MPF and WLR+SMPF for the provision of retail voice and broadband services. Whilst the mix had been changing gradually over time, there was no evidence of the kind of switching that would support a hypothesis that the two inputs were perfect, or near perfect, substitutes.

2.76 In Dr Houpis's view,[88] competition in the downstream retail market from CPs using WLR would be critically dependent on the relationship between the prices of whole-sale inputs used by competitors to BT and the level of retail prices in the downstream market for the relevant services. Dr Houpis noted that it was unclear that the changes in the absolute level of the WLR charge would have a direct impact in themselves. As Ofcom appeared to assume that increases in WLR prices would feed through into increases in the retail line rental prices for voice-only retail customers, the relative level of retail prices of BT and rivals using the WLR service would appear to be unchanged by an increase in the input price. Thus, Dr Houpis suggested that there did not seem to be any reason to expect an increase in the level of WLR prices to have a direct effect on retail competition between BT and rivals using the WLR product.

[86] CPW W/S Houpis IV, §10(c).
[87] CPW W/S Houpis IV, §19.
[88] CPW W/S Houpis IV, §30.

2.77 CPW accepted[89] that there was no single correct answer in specifying appropriate mark-ups to reflect allocative efficiency, there were some answers which were inferior (including, as Ofcom did, merely leaving the differences between prices to reflect (its view of) LRIC differences).

2.78 With regard to the importance of WLR in supporting competition, Mr Heaney said[90] that he agreed that WLR was important. However, it was clear that MPF was a better platform for competition than WLR/SMPF since it was a deeper form of competition. In addition, Mr Heaney said that MPF was becoming relatively more important (and WLR less important), as demonstrated by the shift to MPF from WLR. According to Ofcom's own projections, Mr Heaney noted that from 2009/10 to 2012/13 MPF would increase by 2.9 million lines whilst WLR would decline by 4.1 million lines. Whilst WLR may be important, it was unequivocally clear that MPF was a better platform for competition and would become relatively even more important.

2.79 In response to Mr Shurmer's argument that the operational separation of Openreach meant that BT would not act anti-competitively, Mr Heaney stated:[91]

(a) Within Openreach (which was vertically integrated across MPF and WLR), there was a clear incentive to leverage vertically to favour WLR/SMPF over MPF.

(b) Since Openreach was not structurally separated from the rest of BT (but merely operationally separate), there was some incentive to favour the rest of BT over other operators. Openreach could (and did) favour the rest of BT over competitors by favouring WLR/SMPF.

CPW's WLR hearing (30 April 2010)

2.80 CPW said at its WLR bilateral hearing that its:[92]

> understanding of Ofcom's view, and we agree with that, is what they are trying to do is to ensure the deepest level of competition possible, and the whole idea, the whole concept … of Ofcom's policy is this idea of the ladder of investment which means that a new entrant goes to the first step, the second step and then the third step. So, even if you had such a concern, the implication of that would be that people would be competing more strongly at the deeper level, which is the MPF level. In our view, that reduces further, if you want, any potential concern about that risk. In the longer term, if Ofcom was able today to act as a 'central planner', our understanding is based on their objectives that they would choose MPF. That would be the idea, that the other access products available (such as SMPF) would allow people to be able to do that (use MPF).

2.81 CPW also told us that SMPF-based competition had been the major platform in 2004, but technology had moved on significantly in the last five years, which needed to be reflected in the pricing structure.[93] CPW also said that it was quite possible for one operator to be offering broadband based on SMPF while another operator offered fixed-line services using WLR.[94]

[89]CPW Reply I, §144.
[90]CPW W/S Heaney VII, §86.
[91]CPW W/S Heaney VII, §88.
[92]CPW hearing transcript, 13 May, p23, lines 1–20.
[93]CPW hearing transcript, 30 April, p29, lines 21–32, p30, line 1.
[94]CPW hearing transcript, 30 April, p30, lines 2–14.

2.82 With respect to Ofcom's perceived policy, CPW suggested[95] that 'in the longer term, if Ofcom was able today to act as a "central planner", our understanding is based on their objectives that they would choose MPF'.

Ofcom's WLR hearing (6 May 2010)

2.83 At its hearing, Ofcom said[96] that, if BT were to adopt NGN in local exchanges, it might be appropriate, for allocative efficiency reasons, for the prices of some services to increase—however, dynamic efficiency considerations would point in the opposite direction.

2.84 Ofcom also said that:[97]

> looking at the relativity of WLR plus SMPF versus MPF we are concerned to make sure that we set those relative prices in a way that reflects underlying cost and is likely to be sustainable from both perspectives: in the sense that, from BT's point of view, it invests in network to provide those services, and also from the service provider's point of view that they are not being encouraged to do something which will unwind in two or three years' time and end up costing more.

2.85 In relation to CPW's suggestion of using Ramsey prices, Ofcom said:[98]

> We don't see this as primarily a Ramsey question which is about allocative efficiency. So estimates of allocative efficiency losses through failing to set Ramsey prices, which is essentially where that calculation comes from, I think we just say it's not relevant because if you try to set Ramsey prices in these circumstances you'd be undermined by arbitrage essentially, because this is not a Ramsey question where you set wholesale prices to induce Ramsey retail prices, it's about producing a given set of outputs at minimum cost. So I would be rather dismissive of the allocative efficiency calculation.

2.86 In response to CPW's argument that there was a correspondence in elasticity between the wholesale and retail prices, Ofcom said[99] that there was no correspondence in this case as the same outputs were being provided by a different combination of inputs.

BT's WLR hearing (12 May 2010)

2.87 At its hearing, BT said[100] that it expected there to be an increase in demand from CPs other than BT for WLR. Overall, it expected there to be a growth in the number of MPF lines but that quite a lot of this growth would be accounted for by Sky and CPW moving their customer bases away from using WLR and SMPF, on to using MPF. CPW also stated[101] that there were unlikely to be any new entrants into the market.

---

[95] CPW hearing transcript, 30 April, p23, lines 14–17.
[96] Ofcom hearing transcript, 6 May, pp46&47, lines 18–37.
[97] Ofcom hearing transcript, 6 May, p25, lines 30–37, p26, lines 1–6.
[98] Ofcom hearing transcript, 6 May, p25, lines 30–37, p52, lines 10–22.
[99] Ofcom hearing transcript, 6 May, p6, lines 3–6.
[100] BT hearing transcript, 13 May, p15, lines 26–29, p16, line 1.
[101] CPW bilateral hearing, Dr Houpis, p31.

Ofcom's letter of 19 May 2010

2.88 Ofcom noted[102] that the substitution from WLR+SMPF to MPF was proceeding at some pace, and there was an increasing rate of substitution particularly since the conclusion of the last LLU charge control review.

2.89 Also, Ofcom clarified that although it had observed a trend towards MPF and away from WLR and SMPF by some major CPs, it did not anticipate that this trend would leave BT as the only user of SMPF. Ofcom said that there were certain CPs which did not wish to replace WLR with their own MPF-based voice service, either at all or in areas where investment of this nature was not warranted.[103]

BT's letter of 19 May 2010

2.90 In relation to WLR competition, BT noted[104] that there had been significant new entry using WLR, including 48 new CPs that had commenced taking WLR from Openreach since January 2009, and a further 36 currently 'in establishment'.

CPW's letter of 25 May 2010

2.91 CPW contended[105] that competition based on MPF was preferable over competition based on WLR+SMPF. CPW said that competition based on MPF delivered greater dynamic efficiencies, since it would reach across more of the value chain, and other operators had greater ability to innovate and differentiate. CPW's case was that it was right that the structure of prices should take into account the greater benefit that MPF-based competition delivered, and that setting the price difference above LRIC was the appropriate way to achieve this. CPW considered its arguments entirely consistent with Ofcom's declared policy objectives.

2.92 With regard to the relevance of elasticity of retail products, CPW stated:[106]

> in a hypothetical scenario in which no SMPF product existed, such that broadband + voice could only be provided using MPF, then the two inputs WLR and MPF would be used to provide different retail outputs: access to voice services, and voice + broadband services respectively. There is therefore a link between wholesale and retail products, and prices. To the extent that the demand characteristics for these two outputs were different (and demand for access to voice services was relatively less price sensitive) then it would be desirable to set a price differential above LRIC efficiently to recover any fixed and common costs. CPW did not understand this to be a point of contention, as it has been recognised by Ofcom.

2.93 CPW said[107] that it recognized that to set 'optimal' prices in the current context, and to try mathematically to take into account all relevant considerations, would be difficult.[108] This was precisely why CPW proposed setting CRS prices through the

[102] Ofcom letter to the CC, 19 May 2010, Comments on CPW transcript.
[103] Ofcom letter to the CC, 27 May 2010.
[104] BT letter to the CC, 19 May 2010, Comments on CPW transcript.
[105] CPW letter to the CC, 25 May 2010, Comments on Ofcom transcript.
[106] CPW letter to the CC, 25 May 2010, Comments on CPW transcript.
[107] CPW letter to the CC, 25 May 2010.
[108] See, for example, W/S Houpis I, §60; CPW's comments at its own bilateral hearing on 30 April 2010, transcript, p83, line 31, and p84, line 1.

use of the LRIC+EPMU approach.[109] For reasons already given, CPW believed that this approach represented an appropriate and pragmatic balance between the different efficiency considerations, and could also address Ofcom's concerns, by minimizing any productive inefficiency risks.

2.94 CPW said, for the avoidance of doubt, that CPW did not dispute that Openreach should be allowed to recover its efficiently incurred costs, under any structure of prices, and had not argued that prices should be structured to facilitate market entry.[110]

2.95 With regard to new entrants, CPW argued[111] that Ofcom was incorrect to assert that a consistent use of technology between access and core prices would result in proper entry signals. CPW argued that new entrants only used new technology and if prices were based on old technology, this could result in inefficient entry signals. For example, new entrants were effectively foreclosed from competing with WLR, since old technology costs were used to set prices.

Sky's letter of 26 May 2010

2.96 Sky said that BT had argued that CPs purchasing WLR services from BT in order to be able to offer voice services to their customers were able to offer innovative services.[112] Whilst Sky said it was correct that there was some limited scope for a CP purchasing WLR services to differentiate its voice services to customers, it considered that MPF-based competition provided a much greater opportunity to do so.

The differential between MPF and WLR

Ofcom's Decision

2.97 Ofcom noted[113] in the LLU Statement that the differential between MPF and WLR was particularly important to decisions around the use of MPF for providing voice-only services (as opposed to voice and broadband).

2.98 In the WLR statement, Ofcom said[114] that the differential between MPF and WLR would be an important consideration if the size of the differential appeared likely to create significant productive inefficiencies. However, Ofcom said that in practice it was unlikely that any productive inefficiency would occur if the difference in the charges for WLR and MPF did not reflect LRIC because it was not clear that it would be economic for an LLU operator to provide voice-only services given the economies of scale involved relative to the value of the service.

2.99 As part of the WLR Statement, Ofcom[115] undertook an assessment of the costs and charges for MPF and WLR with a view to establishing whether the differential between them covered LRIC. Ofcom argued that the result of this analysis suggested that the MPF and WLR charges resulted in a differential that broadly reflected the difference in the LRICs. In its WLR Statement, Ofcom calculated[116] the difference in

[109] CPW letter to the CC, 25 May 2010.
[110] CPW letter to the CC, 25 May 2010, Comments on Ofcom transcript.
[111] CPW letter to the CC, 25 May 2010, Comments on Ofcom transcript.
[112] Sky letter to the CC, 26 May 2010, Comments on BT bilateral hearing transcript.
[113] LLU Statement, §§A4.77 & 4.78.
[114] WLR Statement, §5.16.
[115] WLR Statement, §5.17.
[116] WLR Statement, §5.87.

CCA FAC for MPF and WLR in 2012/13 at around £10, which was broadly similar to its estimate of the LRIC differential (£8 to £12).

CPW's Appeal

2.100 Dr Houpis agreed[117] that Ofcom was correct to identify static (ie productive and allocative) efficiency and dynamic efficiency considerations as the key criteria guiding its pricing decisions for the LLU and WLR services. However, he argued that Ofcom was not correct to suggest that productive efficiency considerations were less relevant when comparing the costs of WLR and MPF.

2.101 In response to Ofcom's argument that operators would not wish to use MPF to provide voice-only services since the scale economies would make it unattractive, Mr Heaney[118] claimed that this assertion was incorrect because an LLU operator would leverage economies of scope between using MPF to offer voice-only services as well as voice + broadband services.

2.102 Mr Heaney also noted[119] that CPW had been requesting a product variation that would allow CPW to use MPF to offer voice-only services for over two years.

2.103 CPW also argued[120] that to the extent that Ofcom sought to pursue a social goal rather than one based on promoting economic efficiency, that should be done through other mechanisms, such as explicit funded subsidies, rather than an artificially low price cap.

Ofcom's Defence

2.104 Ofcom[121] considered the differential between MPF and WLR to be less important than the differential between MPF and WLR+SMPF, as it was unlikely to result in a distortion in CPs' choice of wholesale input. Ofcom argued this based on its assertion that MPF was unlikely to be used for providing voice services. Despite this view, Ofcom expressly considered the MPF vs WLR differential and found that the differential was broadly similar to that implied by LRIC. As such, the charges set therefore avoided inefficiencies being created by CPs choosing to use MPF to deliver voice-only services when this had higher total costs to society.

2.105 In the WLR Statement, Ofcom[122] said that the differential between MPF and WLR charges would be an important consideration, if the size of the differential appeared likely to give rise to significant productive inefficiencies. However, Ofcom[123] considered it unlikely that any productive inefficiency would occur if the difference in the charges for WLR and MPF did not reflect LRIC.

2.106 Ofcom[124] believed that there were good reasons to think it unlikely that there would be demand for using MPF for voice-only services when the differential between MPF and WLR was broadly equivalent to the LRIC differential between those services.

[117] CPW W/S Houpis III, §13, referring to WLR Statement, §§5.1 & 5.2.
[118] CPW W/S Heaney I, §§50 & 51.
[119] CPW W/S Heaney I, §52.
[120] CPW WLR NoA, §102.
[121] Ofcom WLR Defence, Annex, §§8 & 9.
[122] Ofcom WLR Defence, Annex, §14.
[123] Ofcom WLR Defence, Annex, §15.
[124] Ofcom WLR Defence, Annex, §19.

2.107 In the event that there was demand for MPF for voice-only services, Ofcom[125] concluded that productive efficiency considerations would be more important than any allocative efficiency considerations, for the same reasons as for the differential between the price of MPF and the price of WLR+SMPF.

2.108 Ofcom[126] argued that it would be inefficient, and against consumers' interests, to accept a very wide differential between MPF and WLR on the basis that it could encourage CPs to use MPF to deliver voice services when this would have higher total costs to society than if CPs used WLR.

2.109 Ofcom noted that CPW had requested a product variation from Openreach to allow a voice-only service.[127] Ofcom[128] stated that CPW proposed a target price for a voice-only MPF product significantly below the standard MPF charge. As this would increase the differential between MPF and WLR by £15 more than was currently the case, in Ofcom's view, this would not be appropriate.

2.110 Regarding CPW's arguments about the pursuance of social goals, Ofcom[129] argued that it was its principal duty, in carrying out its functions, to further the interests of citizens in relation to communications matters and to further the interests of consumers in relevant markets, where appropriate by promoting competition. Ofcom argued that it did not see it as reasonable or proportionate for voice-only consumers to have to pay more to fund the costs of new technology from which they received no substantive benefit above what they could obtain from the existing technology.

2.111 Ofcom also argued[130] that raising the WLR charge further would tend to increase charges for voice-only consumers, including those on social telephony schemes, and this should be considered in setting the relative levels of charges.

2.112 Ofcom[131] did not consider it appropriate to increase the MPF or WLR charges further by means of a steeper glide path or a bigger adjustment to charges in the first year on the basis that operators using MPF made a significant contribution to the competitiveness of the retail broadband market and hence to the benefits which consumers got from broadband service. In Ofcom's judgement, the consumer interest would not be best served by a larger increase in the MPF charge than Ofcom had applied, although this was a matter of judgement and there were some arguments in favour of a larger increase.

2.113 On balance, Ofcom[132] did not consider that it would be appropriate to raise the WLR charge further, and argued that charges set by Ofcom already narrowed the wholesale differentials sufficiently to avoid significant economic inefficiencies.

BT's Intervention

2.114 BT supported[133] Ofcom's conclusion that there was no reason to force Openreach to provide an xMPF product. In addition, BT suggested that it would be particularly inappropriate to consider changing relative pricing of existing products (eg WLR, MPF)

[125] Ofcom WLR Defence, Annex, §17.
[126] Ofcom WLR Defence, Annex, §21.
[127] Generally referred to as an 'xMPF product', that is a voice-only product which could be provided by a LLU operator to use MPF for voice-only.
[128] Ofcom WLR Defence, Annex, §20.
[129] Ofcom WLR Defence Annex, §63.
[130] Ofcom LLU Defence, Annex D, §33.
[131] Ofcom LLU Defence, Annex D, §31.
[132] Ofcom LLU Defence, Annex D, §34.
[133] BT W/S Dolling III, §32.

in order to make an xMPF product commercially attractive. This would amount to artificially skewing the market to encourage inefficient investment.

2.115 BT argued[134] that it was clear that CPW was able to demand MPF from Openreach and directly market a voice-only service over MPF while reselling broadband over MPF on to a third party wholesaler or vice versa if CPW considered it economically viable. If CPW considered it economic, it was able to use the Openreach MPF service to develop a number of different product variants, and effectively mimic the product variants provided by Openreach. Mr Dolling noted that this happened in practice rarely, if at all.

2.116 At the bilateral hearing with BT, Mr Shurmer on behalf of BT said:

> One of the things that struck me when preparing for this, is if you look at our installed base something like around 21 million WLR lines in total, of which around [✂] of those only have WLR on the line. The remainder have SMPF as well, so they have a combination of voice and broadband, but [✂] of our 21 million base is voice only.[135]

CPW Reply V (29 March 2010)

2.117 CPW claimed[136] that Ofcom sought to dismiss the relevance of the MPF vs WLR price difference by saying that a higher price difference between MPF and WLR would result in economic inefficiency. CPW considered this to be a circular argument, suggesting that Ofcom appeared to be arguing that since there was no demand to offer voice-only services today and a large price change would be required to make it commercially viable and induce entry, there could be no productive inefficiency. CPW claimed that the mistake in Ofcom's argument was that, if the price difference was correct, then there would be entry.

2.118 Although Ofcom had asserted[137] that there was likely to be no benefit from the price difference between MPF and WLR even being equal to the LRIC cost difference, CPW argued that, because Ofcom had ignored the significant economies of scope between using MPF to deliver both broadband and voice and MPF to deliver voice alone, it was incorrect for Ofcom to assert that it was unlikely that there would be any productive inefficiencies if the price difference between MPF and WLR was smaller than the LRIC cost difference.

2.119 In response to Ofcom's concern that increased voice prices could lead to higher retail prices for some 'vulnerable' voice-only customers, Dr Houpis suggested[138] that such customers were likely to represent only a very small proportion of voice-only customers, and an even smaller proportion of all customers. Moreover, Dr Houpis indicated that there were other regulatory tools available to Ofcom to protect vulnerable customers which would not lead to distortions for all customers across the market.

Ofcom's hearing (6 May 2010)

2.120 Ofcom argued[139] that the charges set avoided inefficiencies being created by CPs choosing to use MPF to deliver voice-only services, when this had higher total costs

[134] BT W/S Dolling III, §32.
[135] BT hearing transcript, 13 May, p11, lines 10–19.
[136] CPW W/S Heaney VII, §85.
[137] CPW Reply V, §6.
[138] CPW W/S Houpis IV, §31.
[139] Ofcom hearing transcript, 6 May, p22, lines 30–36.

to society. This was based on Ofcom's view[140] that it was unlikely to be economic for a CP to provide voice-only services with MPF, given the economies of scale involved relative to the value of the service.

2.121 Ofcom argued[141] at its bilateral hearing that there were 15 million customers who depended on voice services based on the WLR service and hundreds of companies that used WLR as an input. Ofcom stated that if changes were made of the sort that CPW proposed, the economics of those businesses would be threatened fundamentally.

2.122 Ofcom argued[142] that if the price differential between MPF and WLR was changed to a set of prices that reflected a £40 difference suggested by CPW, as opposed to the £10 or so difference that was established in the price controls, the second order effects were likely to mean that the demand characteristics for these services would change markedly. In itself, that would lead to instability in the cost recovery system.

2.123 Ofcom stated[143] that it did not agree with CPW's argument that NGN costs that were essentially about providing enhanced functionality in relation to broadband should find their way into increasing the estimated costs and the prices of delivering core telephony services using existing technology.

2.124 Ofcom was not convinced[144] there was a good economic reason for agreeing to a new charge control that would increase prices for voice-only products (WLR). While Ofcom considered that its position stood up on economic grounds, the social impacts of such a price increase were supportive of its position.

Ofcom's letter of 19 May 2010

2.125 Ofcom argued[145] that in the unlikely event that BT reverted to its earlier plan of providing NGN-linked access products (rather than moving straight to NGA), it would have used MPF as an input. However, while this would require the development of a technical solution to allow the continuation of SMPF by third parties, it would not necessarily lead to the creation of an xMPF product for all CPs as this would be technically different from the BT solution and, therefore, would only be warranted if there was a separate policy/business case for its development.

2.126 Ofcom noted that Mr Heaney had said 'If they [BT] did do an NGN with convergent MSANs then they would have to use MPF and they would also then have to create an xMPF product, probably, and therefore there would be a level playing field'. Ofcom said that[146] this statement was based on a number of assumptions and confused the possible requirement for BT to be able to continue supporting WLR and SMPF-type services and the creation of an xMPF product which could be used by all CPs.

[140] Ofcom hearing transcript, 6 May, p22, lines 30–36.
[141] Ofcom hearing transcript, 6 May, p89, line 28, to p90, line 32.
[142] Ofcom hearing transcript, 6 May, p50, lines 4–31.
[143] Ofcom hearing transcript, 6 May, p89, line 28 to p90, line 32.
[144] Ofcom hearing transcript, 6 May, p57, line 21 to p58, line 5.
[145] Ofcom letter to the CC, 19 May 2010, Comments on CPW transcript.
[146] Ofcom letter to the CC, 19 May 2010, Comments on CPW transcript.

CPW's letter 25 May 2010

2.127 CPW confirmed [147] that it had asked for an xMPF product so that it could offer customers a voice service and allow them to take broadband from another supplier, and in doing so compete on a level playing field with BT. CPW indicated[148] that it had engaged in a range of discussions with Openreach on the xMPF product from late 2007 to early 2009.

2.128 CPW disagreed[149] with a suggestion made by Ofcom at its hearing that providing voice-only services using MPF was not an efficient way of using the network and that the cost of monitoring/policing would more than offset the savings from the line having fewer faults. CPW suggested that the cost of monitoring would be small since it could be covered by a contractual commitment and those companies that could use xMPF were large companies and were unlikely to breach contract provisions. The reduction in faults that would occur from removing the broadband product would be, according to Ofcom, worth around £3. It was wholly implausible, therefore, that the additional monitoring cost would offset the fault cost reduction.

2.129 In response to Ofcom's assertion that CPW suggested that the price of xMPF should be calculated as the MPF less the price of SMPF, CPW stated that that was not its view. CPW indicated that a previous quote on the issue (that CPW provided to BT in October 2007) was superseded by many other discussions, in greater detail, about the xMPF product and pricing.[150]

2.130 CPW argued[151] that Ofcom's suggestion that increasing WLR charges would threaten a large number of smaller businesses was fallacious because businesses could offset increases in their input costs and some of these businesses would benefit from falls in the price of services.

CPW's letter of 26 May 2010

2.131 In response to BT's suggestion that MPF could be used to offer voice-only services,[152] CPW indicated[153] that although this was technically correct, it did not present the complete picture. CPW said that to use MPF to provide a voice-only product, the customer would be unable to take a broadband service from another provider; hence the need for the xMPF product.

LRIC+EPMU vs CCA FAC

Ofcom's Decision

2.132 In its WLR Statement, Ofcom confirmed,[154] in line with other regulatory charge-setting exercises (in particular, determining the appropriate charges for MPF and SMPF rental in the LLU Statement), that it decided to use CCA FAC data for setting WLR charge controls. As set out in Annex 4 of the LLU Statement, Ofcom considered CCA FAC appropriate based on the following:

---

[147] CPW letter to the CC, 25 May 2010, Comments on Ofcom transcript.
[148] CPW letter to the CC, 25 May 2010, Comments on Ofcom transcript.
[149] CPW letter to the CC, 25 May 2010, Comments on Ofcom transcript.
[150] Ofcom transcript, 6 May, p86, line 34 to p87, line 7.
[151] CPW letter to the CC, 25 May 2010, Comments on Ofcom transcript.
[152] BT transcript, 13 May, p18, lines 24–26.
[153] CPW letter to the CC, 26 May, Comments on BT bilateral hearing transcript.
[154] WLR Statement, §§5.9 & 5.10.

(a) It was a widely understood concept and had been the anchor point for many previous price controls.

(b) It used data that could be reconciled to the regulatory financial statements which were published and audited.

2.133 Ofcom stated[155] in the LLU Statement that it preferred to use CCA FAC as a cost standard to using long-run incremental costs with an equal proportionate mark-up (LRIC+EPMU), because CCA FAC used data that could be reconciled to the regulatory financial statements, which had been audited and were in the public domain.

2.134 Ofcom believed[156] that setting charges on a CCA FAC basis was broadly neutral as regarded the choice between wholesale products because the differential between MPF and WLR+SMPF was broadly reflective of LRIC, and was certainly not less than it.

2.135 Ofcom argued[157] that, given that LRIC+EPMU was not conceptually superior to CCA FAC, and that CCA FAC was more practical and transparent, it considered that FAC remained preferable to LRIC+EPMU. Ofcom noted that using CCA FAC was also consistent with other charge controls set for Openreach and BT more generally, which was important for ensuring sustainability, in the sense that a consistent approach ensured that all common costs could be recovered and BT could earn its cost of capital.

2.136 Ofcom also concluded[158] that there were not strong efficiency reasons for moving away from CCA FAC.

2.137 Should the MPF charge make a significantly lower contribution to recovery of common costs than WLR+SMPF, Ofcom believed that this would create distortions that would reduce efficiency:[159]

> For example, for LLU operators to choose between MPF and WLR+SMPF on their merits, the difference in charges should be comparable to the differences in incremental costs for Openreach. We considered the potential distortions to competition in the longer term could be significant. Such distortions were, in our opinion, likely to be the most important static efficiency consideration. We considered that charging on the basis of CCA FAC was likely to be broadly consistent with removing these static distortions.[160]

2.138 In addition to considering the potential impact on competition, Ofcom said[161] that it considered the need to ensure that investment incentives were not distorted by the regulatory process, including how it evolved over time. Ofcom argued that this tended to provide support for a CCA FAC basis for determining charges in the longer term, but with any increase being phased in gradually.

[155] LLU Statement, §A4.6.
[156] Ofcom LLU Defence, Annex D, §38.
[157] LLU Statement, §A4.6
[158] LLU Statement, §A4.7.
[159] LLU Statement, §A4.9.
[160] LLU Statement, §A4.9.
[161] LLU Statement, §A4.11.

CPW's Appeal

2.139 CPW argued that for reasons of both productive and allocative efficiency the WLR+SMPF vs MPF and WLR vs MPF differentials should both be larger than the differences in their LRICs.[162]

2.140 By relying on BT's CCA/FAC data, Dr Houpis considered[163] that Ofcom was placing too great a weight on simplicity and continuity with the current regulatory regime and that Ofcom attached an unjustifiably high weight to productive efficiency considerations, compared with allocative and dynamic efficiency considerations. He argued that the forward-looking LRIC would be the appropriate cost standard since it reflected the true opportunity cost to society of using either MPF, or WLR+SMPF, for the provision of retail broadband and voice services.

2.141 In CPW's view,[164] allocative and dynamic efficiency considerations were equally important as, if not more important than, productive efficiency, and that the potential impact from productive efficiency distortion was small.

2.142 Dr Houpis considered[165] that Ofcom's use of CCA FAC was extremely unlikely to provide an accurate estimate of the relevant differential because:

(a) Ofcom used a cost allocation methodology for some of the largest element of costs which did not reflect true incremental costs;

(b) Ofcom relied on annualized capital charges based on straight-line depreciation for existing assets which were now fully depreciated, which did not reflect forward-looking LRICs; and

(c) costs had been projected forwards from their current level without taking account of efficiency gains in provision of the MPF products.

2.143 Dr Houpis accepted[166] that it was necessary to provide an adequate degree of stability, but this did not justify the use of an out-of-date or inaccurate cost methodology or model.

2.144 Dr Houpis considered[167] that the use of Ofcom's CCA FAC approach resulted in prices for WLR that did not reflect the true underlying difference in the LRICs of WLR and MPF and, therefore, resulted in a price for WLR that was too low relative to MPF. He expected this to result in a less efficient price structure than could otherwise be achieved.

2.145 CPW claimed[168] that Ofcom failed to provide an explanation as to why the cost difference should not merely be 'broadly reflective' of LRIC rather than at a minimum reflective of LRIC differences.

2.146 CPW noted[169] that Ofcom had stated that the difference between MPF and WLR+SMPF should 'broadly reflect incremental costs differences' and its MPF and WLR charges result in 'a differential that broadly reflects the differences in LRICs'. CPW

[162]WLR NoA, §78.2.
[163]CPW W/S Houpis I, §21.
[164]CPW hearing transcript, 30 April, p24, lines 1–8.
[165]CPW W/S Houpis I, §29.
[166]CPW W/S Houpis I, §85.
[167]CPW W/S Houpis III, §14.
[168]CPW WLR NoA, §87.4.
[169]CPW WLR NoA, §85.

argued[170] that Ofcom had provided no positive reason why, as a matter of economic principle, one would intentionally depart from using LRIC. Nor had Ofcom provided any assessment of the potential size of any distortion, and why it could be safely discounted.

Ofcom's Defence

2.147 Ofcom[171] defended the use of CCA FAC by arguing that the methodology was widely understood and was able to be reconciled to the audited regulatory financial statements. Ofcom expressly recognized that despite these advantages, CCA FAC might not necessarily lead to the most efficient outcome. Ofcom therefore considered whether there were any strong objections to CCA FAC on efficiency grounds. As part of this assessment, Ofcom considered differentials between the wholesale charges.

2.148 Ofcom argued that the CCA FAC was preferable to a LRIC methodology because:[172]

(a) CCA FAC data could be reconciled to the regulatory financial statements which were audited and in the public domain. CCA FAC therefore had important advantages of transparency and practicality over unaudited and unpublished LRIC+EPMU data.

(b) Whilst LRIC+EPMU had been used in the past, more recent controls, including those on BT's partial private circuit and network charges, had been based on CCA FAC data. These were services with which MPF and WLR were likely to share significant common costs.

(c) Using a consistent definition of costs across charge controls ensured sustainability and avoided possible over-recovery of common costs which could result from using inconsistent cost concepts. This was because it allowed common costs to be just fully recovered over all the controls taken together.

(d) The use of CCA FAC helped to provide a stable regulatory framework, because it was what Ofcom had used in the past for setting MPF, WLR and other charges. Regulatory stability was important to give operators the confidence to invest in networks.

2.149 Ofcom suggested[173] that using CPW's approach of setting individual charges on a LRIC basis would lead to a possible cost recovery issue because of the problems associated with attempting accurately to forecast volumes for the MPF and WLR+SMPF. If volumes were very different to those forecast, then Openreach may be unable to recover its total common costs even if, at forecast volumes, revenues would have been sufficient.

2.150 Ofcom believed[174] that the price differentials generated by setting charges equal to CCA FAC were reasonable and broadly consistent with considerations of economic efficiency. It considered that it would not be practicable to attempt to optimize charges in any more detailed way. Moreover, the charges resulting from Ofcom's approach were consistent with other policy considerations, such as the desire not to raise MPF charges too sharply or undermine retail narrowband competition, and with

[170] CPW WLR NoA, §91.
[171] Ofcom WLR Defence, Annex, §§4 & 5.
[172] Ofcom LLU Defence, Annex D, §40.
[173] Ofcom LLU Defence, Annex D, §§42 & 43.
[174] Ofcom LLU Defence, Annex D, §50.

minimizing the increases in charges for voice-only consumers, including those on social telephony schemes.

2.151 Ofcom proposed[175] to increase charges to the level of CCA FAC gradually over time by means of a glide path. This would strike an appropriate balance between considerations of static and dynamic efficiency. Gradual changes helped avoid shocks and provide stability. Because of the importance of the potential distortion between wholesale charges (productive efficiency), Ofcom concluded that an 'accelerated glide path' was appropriate. The phased approach underlying the contested decisions showed the weight that Ofcom placed on dynamic efficiency considerations.

BT's Intervention

2.152 BT supported[176] the use of CCA FAC for the purposes of calculating the cost stacks of the products in question.

2.153 In contrast to the CCA FAC approach, Mr Esslin-Peard argued[177] that the LRIC plus EPMU model would not be audited nor transparent and was inevitably complex. In addition, an external audit of an 'LRIC model' for the entire business would be difficult, time-consuming, labour-intensive and costly. In essence, the use of LRIC for pricing purposes would, if applied in the same way as BT's reporting obligations, require BT to maintain two separate models, to the same standards, one used for reporting and one used for pricing. It would in any event mark a large step to move away from BT's published audited accounts as the basis for price control models.

CPW's Reply V (29 March 2010)

2.154 Dr Houpis believed[178] that Ofcom exaggerated the benefits of using CCA FAC compared with the alternatives for three reasons:

(a) LRIC+EPMU estimates could be produced with at least as good a level of transparency on a forward-looking basis. For example, mobile termination rates were set by reference to a LRIC+EPMU model which was publicly available, notably in contrast to the forecast model used to set the CRS price controls.

(b) In fact, the level of transparency of the CCA FAC estimates was poor—in part, given the approach used by Ofcom in depending on a model supplied by BT.

(c) The two most important inputs for the CRS, the costs of duct and cable, were calculated on a regulatory asset value (RAV) adjusted basis, which differed from the CCA FAC basis that was used for the purposes of setting CRS prices. The RAV adjustments applied by BT were made outside the regulatory accounts and, as such, were not subject to the same degree of transparency and certainty as the accounts. It was also possible that the adjustments had impacts on other RAV-based cost allocations. This difference in cost approach prevented a direct reconciliation between the CCA FAC accounts and the base year cost information provided during the consultation process. This reduced any alleged benefits, in terms of regulatory certainty, that would arise from having the CRS prices based directly on the CCA FAC accounting data.

---

[175] Ofcom LLU Defence, Annex D, §44.
[176] BT WLR SoI, §26.
[177] BT W/S Esslin-Peard III, §§12–14.
[178] CPW W/S Houpis IV, §39.

2.155 While Mr Heaney accepted[179] that CCA FAC and LRIC[180] could in principle result in similar levels of cost if exactly the same underlying assumptions had been used, the correct assumptions to use to calculate LRIC[181] costs (such as use of NGN technology, inclusion of migration costs and no line-card cost sharing) were different from the assumptions Ofcom used to prepare the CCA FAC costs. In addition, Mr Heaney suggested that the allocation of common costs was done differently between LRIC and CCA FAC approaches; CCA FAC used allocation bases such as revenue, assets and headcount, whereas in LRIC+EPMU common costs were allocated in proportion to LRIC costs.

2.156 Mr Heaney argued[182] that even looking at Ofcom's assumptions, it was clear that there were several cases where Ofcom's CCA FAC cost estimates were very different from Ofcom's LRIC cost estimates:

- Line length adjustment: CCA FAC £1.06; LRIC: £0.00.
- Network repair costs: CCA FAC £1.65; LRIC: £0.00.
- Line card: CCA FAC £12.69; LRIC: £15–£20.
- Directory cost: CCA FAC ~£1.80; LRIC: £0.50.

2.157 Based on this analysis, Mr Heaney argued[183] that Ofcom's claim that CCA FAC and LRIC costs were the same, or similar, was not correct.

2.158 In response to Mr Esslin-Peard's witness statement regarding the difficulty in estimating CCA FAC costs compared with constructing a model to estimate LRIC costs,[184] Mr Heaney argued[185] that a full LRIC model would not be required in order to calculate the cost differences. Instead, Mr Heaney suggested that Ofcom could use a relatively simpler model that focused on the costs that differed and the calculation of the relevant differences.

Ofcom's WLR hearing (6 May 2010)

2.159 At its bilateral hearing, Ofcom suggested[186] that CPW's EPMU methodology was not based on any particularly robust economic principle, and that approach would result in some consumers paying more for existing services when they had no need to do so.

CPW's letter of 25 May 2010

2.160 At its bilateral hearing, Ofcom suggested[187] that EPMU (ie allocating common costs in proportion to the LRIC costs) 'is not based on any particularly robust economic principle' and was 'arbitrary'. In response, CPW said[188] that in the case that (super-) elasticities for services were equal, a LRIC+EPMU mark-up would be the theoretically appropriate way to recover fixed and common costs to achieve efficient out-

[179] CPW W/S Heaney VII, §26.
[180] Or LRIC+EMPU.
[181] Or LRIC+EMPU.
[182] CPW W/S Heaney VII, §28.
[183] CPW W/S Heaney VII, §29.
[184] BT W/S Esslin-Peard II, §§10–20.
[185] CPW W/S Heaney VII, §30.
[186] Ofcom WLR bilateral transcript, p17.
[187] Ofcom hearing transcript, 6 May, p17, lines 6 & 117.
[188] CPW letter to the CC, 25 May 2010, Comments on Ofcom transcript.

comes. In contrast, CPW suggested that the CCA FAC approach would, even under these conditions, produce a set of prices that were inefficient unless they happened by coincidence to be equal to the LRIC+EPMU prices.

2.161 While CPW said[189] it did not suggest that EPMU provided optimal prices, it was a widely-used convention for the recovery of common costs which provided transparency, and that it provided more appropriate pricing than CCA FAC. CPW noted that where Ofcom used a LRIC approach to set prices, some form of EPMU recovery of common costs was generally used. CPW suggested that if the concern were to be whether the chosen methodology was based on robust economic principle, it would argue that CCA FAC was more 'arbitrary' as both incremental and common costs were allocated on the basis of what BT considered 'reasonable' using backwards-looking data, and this did not have the virtue of the same level of transparency.

CPW's letter of 26 May 2010

2.162 CPW did not[190] agree that CCA FAC was a proxy for LRIC+EPMU. CPW accepted that the two methods might happen by chance to produce similar results, but that did not mean that the two methods were proxies for each other.

Estimation of LRIC—technology assumptions

Ofcom's Decision

2.163 In the WLR Statement, Ofcom said,[191] given that the cheapest way to provide voice services would be to maintain the existing 'legacy' TDM technology, it considered one reasonable approach to setting charges would be on that basis.

2.164 While Ofcom considered[192] using NGN technology (ie multi-service access nodes or MSANs) as the MEA, it suggested that should charges be set on that basis, a decision would have to be made as to how the MSAN costs could be recovered, as MSANs provided both voice and data services. Under that scenario, Ofcom considered that the costs recovered from voice-only customers should be capped at the level that would be implied by hypothetical continued use of the existing TDM technology. Ofcom argued that that was because it would hypothetically be possible to continue to provide voice-only services with the existing TDM technology. Ofcom did not consider it appropriate that voice-only customers should pay more as a result of using more cost-effective technology.

CPW's Appeal

2.165 CPW considered[193] that Ofcom erred in its calculation of LRIC because it had not used a forward-looking long-run MEA, which in this case it believed was NGN technology (rather than the older TDM technology BT currently used).

2.166 CPW argued[194] that Ofcom had departed from the normal regulatory practice of basing costs on the MEA, and Dr Houpis argued[195] that:

[189] CPW letter to the CC, 25 May 2010, Comments on Ofcom transcript.
[190] CPW letter to the CC, 26 May, Comments on BT bilateral hearing transcript.
[191] WLR Statement, §5.23.
[192] WLR Statement, §5.23.
[193] CPW WLR NoA, §103.
[194] CPW WLR NoA, §92.
[195] CPW W/S Houpis III, §21.

when considering the costs of services that are based on the deployment of assets that are expected to be used for a number of years, the relevant cost concept where these services are, or could realistically be, offered competitively are the most efficient forward looking costs that are, or would be, incurred by an operator providing these services (rather than the sunk costs of any assets in operation). Prices based on such costs are likely to better approximate prices that could be expected in a competitive market, the level of which would be constrained by potential entrants or existing rivals using the most efficient technology. This concept of basing costs on the use of the most efficient technology is encapsulated in the MEA (modern equivalent asset) approach.

2.167 Dr Houpis asserted[196] that in the case of provision of WLR, it was well accepted that an NGN was the relevant MEA. In support of this argument, Dr Houpis quoted the European Regulators Group (ERG): 'NGNs will become, or are already, the accepted modern equivalent asset (MEA) for core networks'.

2.168 Dr Houpis criticized[197] Ofcom for deciding to estimate costs based on legacy technology for a number of reasons:

(a) Ofcom's approach could be expected to result in WLR being priced at less than the MEA cost and, potentially, usage charges rising above their MEA costs to allow overall cost recovery. This could be expected to have a number of detrimental implications for economic efficiency, including:[198]

(i) Costs would be recovered in a way that implied that the price of certain services would be set below efficient cost, and of others above efficient cost, leading to allocative inefficiency.

(ii) The speed of investment in NGN could be unnecessarily delayed, leading to loss of potential productive efficiencies, as the NGN technology was expected to result in lower costs.

(iii) Competitors (including mobile) that could be able to offer voice services potentially more efficiently than BT to voice-only customers could be discouraged or prevented from doing so, where it could have been efficient to do so.

(b) A policy of setting the prices of WLR below the MEA costs would also imply that the cost difference between MPF and WLR would be capped at the level implied by the use of the current legacy technology (TDM) to set the WLR charge. An efficient entrant (who would or could only use NGN) may not be able to compete in the provision of voice services with BT, if it could not profitably replicate the equivalent product to WLR using the relevant MPF product and NGN technology to offer voice services. Therefore, such efficient providers may not be able to compete with BT for such customers, even though they could offer voice services over NGN potentially more efficiently than BT itself.

[196]CPW W/S Houpis III, §21.
[197]CPW W/S Houpis III, §22.
[198]CPW W/S Houpis III, §27.

(c) The deployment of next-generation technology was expected to lead to lower overall costs for the provision of voice and data services for BT. BT itself had estimated overall cash cost savings of £1 billion a year from roll-out of NGN.[199]

2.169 Dr Houpis noted[200] that the cost structures of NGN differed from legacy networks. Under a legacy TDM network, Dr Houpis argued that the cost of the equivalent technology should be recovered from subscriptions, call services and broadband services. Under the NGN, the cost of the equivalent technology[201] should be recovered solely from subscription charges. Therefore, even though the overall cost from the deployment of NGN was lower, there was no reason to expect that the costs of each and every individual service should be lower in an NGN than a legacy network.

2.170 CPW suggested that setting prices for WLR lines based on NGN costs would not be against the interests of voice-only customers based on the following:[202]

(a) Setting prices for WLR on the basis of costs which reflected appropriately the efficient MEA costs was consistent with a significant number of current voice-only customers paying less for the voice services they consumed, and an even greater number of voice-only customers paying less over their customer lifetime. This effect was a result of lower usage charges and an expectation that many current voice-only customers would become voice + broadband customers.

(b) Setting prices based on NGN MEA costs would reduce the risk of a slow deployment of NGN, leading to improved productive efficiency for the delivery of both voice and broadband services.

(c) Setting prices based on NGN MEA costs would avoid undermining efficient competition by ensuring that an appropriate margin existed for rivals to be able to compete profitably with BT for the provision of voice-only services.

(d) Setting the WLR charges on a legacy cost basis would discourage competitors (including mobile), which would be able to offer voice services potentially more efficiently than BT to voice-only customers.

(e) Setting the WLR charge on a legacy cost basis was also much more likely to lead to an efficient consumption of services delivered using the next generation networks.

(f) To the extent that it was necessary to protect vulnerable consumers from any potential price increases, there were other instruments available to Ofcom which could achieve this objective with significantly less market distortion.

2.171 After Ofcom's financial models for the WLR Statement were finalized, BT decided to delay its planned NGN roll-out. As such, Mr Heaney suggested that Ofcom's financial model no longer accurately reflected BT's expected outcome—for example:[203]

(a) BT's modelled costs were based on existing technology, which BT was not planning to continue to deploy. Therefore, CPW argued that the modelling did not reflect an MEA approach, or forward-looking costs.

[199] CPW W/S Houpis III, §25.
[200] CPW W/S Houpis III, §26.
[201] ie MSANs.
[202] CPW W/S Houpis III, §40.
[203] CPW W/S Heaney I, §224.

(b) In some of the calculations, Ofcom had assumed that the line card was shared with broadband. CPW considered this inaccurate given that BT's revised 21CN plans involved providing some voice services on voice-only MSANs.

(c) CPW said that Ofcom ignored the incremental cost of certain migrations, which would have to be recovered through the WLR/WLR+SMPF rental charges.

(d) Ofcom appeared to have assumed the same, or higher, fault rate on MPF compared with WLR and SMPF, when both theory and practice supported the view that fault rates would be higher on WLR than MPF and even higher again on WLR+SMPF than MPF.

2.172 Mr Houpis noted[204] that Ofcom had previously suggested that due to the development of NGA, the benefits of competition based on MPF might be transitory, as NGA might limit remaining life of existing technologies. However, Dr Houpis claimed that this did not provide a rationale for setting wholesale charges in such a way as protected existing SMPF+WLR providers when on the basis of today's technology MPF appeared to provide the more efficient solution.

Ofcom's Defence

2.173 Ofcom[205] did not accept that using MEA costs would result in a higher charge for WLR. To the extent that MEA arguments were relevant, Ofcom argued that the value of a modern asset which was the equivalent of a TDM line card (that is, the MEA) was one which did not have additional functionality, and might be well proxied by estimates based on the cost of the current technology. In this way, Ofcom argued that to estimate the MEA it would be necessary to adjust the cost of NGN assets downwards, to remove the value of extra functionality.

2.174 Ofcom[206] argued that cost-effective investment was encouraged if prices were left unchanged by the introduction of new technology, as this gave the regulated business an incentive to minimize costs. By contrast, if the introduction of new technology was allowed to lead to higher charges, inefficient investment could be encouraged.

2.175 Ofcom[207] stated that it pursued a 'technology-neutral'[208] approach to setting charges:

> This means that it continues to set charges based on the existing or legacy technology until the new technology becomes established. Once a new technology has been established, charges can gradually be moved to reflect the new technology, in terms of both the level and structure of charges.

2.176 The key advantage Ofcom[209] saw with this 'technology-neutral' approach was that it provided BT (and LLU operators) with good incentives in terms of whether, and when, to invest in a new technology. If all relevant charges were set on the basis of continued use of the existing or legacy technology, Ofcom suggested that companies

[204]CPW W/S Houpis I, §82.
[205]Ofcom WLR Defence, Annex, §26.
[206]Ofcom WLR Defence, Annex, §25.
[207]Ofcom WLR Defence, Annex, §§31 & 32.
[208]On 19 February 2010, CPW made an application to the Tribunal for a formal declaration that, in the absence of Ofcom being granted permission to amend its LLU Defence, Ofcom could not advance the 'technology neutrality' point in the LLU Appeal. On 5 March 2010, the Tribunal wrote to CPW's solicitors, Osborne Clarke, stating that, in the Tribunal's judgment, Ofcom's pleading (ie the LLU Defence) was sufficient to raise the issue of technology neutrality.
[209]Ofcom WLR Defence, Annex, §32.

would have an incentive to invest in the new technology only if it lowered costs compared with the old technology.

2.177 Ofcom drew[210] a distinction between dealing with 'business as usual' technological change, where regulation could be based on an RPI–X approach, and a 'paradigm shift' where the technology was new and possibly untried.

2.178 Ofcom[211] argued that its technology-neutral approach provided better incentives for both productive and dynamic efficiency, which, over time, should result in lower prices to consumers. Ofcom said that it gave less weight to allocative efficiency, because it considered that trying to set prices correctly at every point in time would be extremely difficult, and involved a much higher risk of regulatory failure. Ofcom[212] considered that this approach would not delay deployment of more efficient NGN technology.

2.179 Ofcom noted[213] that there were significant practical challenges to setting charge controls on the basis of a technology that had not yet become well established. For example, it would not always be clear what was the most efficient new technology at any point in time, and the lack of robust data, particularly in the early stages of adoption of that technology, made setting charges very difficult.

2.180 Ofcom noted[214] that uncertainties meant that there would be a significant risk of setting an inappropriately high or low price, leading to a windfall gain or loss. If the price were set too high, then this would fail to adequately protect consumers. But if it were set too low, this could undermine the incentive to invest.

2.181 In addition, Ofcom argued[215] that setting prices based on a technology that was not established would provide poor incentives to invest in efficient technology. In particular, this approach would make it difficult to ensure a reasonable expectation of cost recovery over time, and reduce the returns to investing in a more cost-efficient technology in the shorter term.

2.182 Ofcom[216] also noted that it set charges for all BT's regulated products on the same basis as the WLR charge under appeal, that is, on a legacy cost basis. Ofcom argued that this consistency of approach across regulated products was important if the new technology was cheaper overall, even though some particular services were higher cost. In this case, a technology-neutral approach, both BT and other CPs would have an incentive to invest in the new technology.

2.183 Ofcom[217] argued that its approach allowed a new entrant using a more efficient technology to enter the market, if the technology was lower cost across all relevant charge controls. As such, Ofcom rejected CPW's view that the approach would lead to distortions and a weakening of competition because a new entrant would be forced to compete with an artificially-constrained WLR price.

2.184 Ofcom[218] suggested that the fact that BT had not yet moved to NGN, despite good incentives to do so if it was cheaper, suggested that it was not a 'clear-cut' issue of

[210]Ofcom WLR Defence, Annex, §42.
[211]Ofcom WLR Defence, Annex, §§42 & 43.
[212]Ofcom WLR Defence, Annex, §47.
[213]Ofcom WLR Defence, Annex, §40.
[214]Ofcom WLR Defence, Annex, §41.
[215]Ofcom WLR Defence, Annex, §42.
[216]Ofcom WLR Defence, Annex, §§35 & 36.
[217]Ofcom WLR Defence, Annex, §48.
[218]Ofcom WLR Defence, Annex, §60.

efficiency to move to NGN now. Ofcom also said[219] that it was not clear what the MEA was, and BT was considering 'leapfrogging' MSAN technology.

2.185 Ofcom[220] argued that if MSANs provided better value overall, then CPs like CPW which had invested in them should be able to offer packages to consumers that were better value than comparable packages offered using the legacy technology. Accordingly, there would be good incentives for BT and other CPs to invest in MSANs. Ofcom therefore considered that the way it had set charges provided good incentives in terms of encouraging efficient investment in new technology for both BT and other CPs.

2.186 Ofcom did[221] not consider it appropriate that voice-only customers should pay more as a consequence of the availability of new technology that might be more cost effective for providing voice and data services together, but which represented a more expensive way of offering voice-only services and did not provide voice-only customers with a significantly better quality of service than could be achieved using the existing technology.

2.187 Regarding CPW's argument that low-usage consumers would be disincentivized from switching to lower-cost alternatives, Ofcom[222] believed that, on the contrary, it might be efficient for voice-only customers to continue to be served using PSTN cards. Running costs appeared likely to be low and the opportunity cost of continuing to use TDM line cards to provide voice services. Therefore the costs avoided by BT when a low-use voice-only customer switched to a competitor were unlikely to be greater than the costs incurred in connecting that customer to a new network. Appropriate signals were likely to be given by setting charges on the basis of TDM costs and, in these circumstances, increasing the WLR charge in the way suggested by CPW would in fact create an inefficient and excessive incentive for voice-only customers to leave BT's fixed network.

2.188 In relation to CPW's argument that NGN technology would result in many voice-only customers facing lower overall prices as a result of lower-cost calls (even though the access charge would increase), Ofcom[223] noted that, over the long term, the incentives established by the technology-neutral policy should result in lower prices for consumers using CPW's approach. In addition, Ofcom argued that its approach might also lead to lower prices in the short term compared with CPW's approach because it was possible that it might be more efficient to continue using the existing technology and wait until NGN technology became cheaper, or perhaps to follow an alternative investment strategy. This was especially so given that the transitional costs of moving from one technology to another were likely to be considerable.

2.189 Regarding CPW's argument that prices would be constrained by obsolete legacy technology, Ofcom[224] argued that the existing technology was not obsolete and would be used by BT for many years, and if investments in NGN networks would allow services to be provided more cheaply, then CPs would have a strong commercial incentive to make that investment and provide cheaper services than BT.

[219]Ofcom letter 28 May, p22.
[220]Ofcom WLR Defence, Annex, §§37 & 38.
[221]Ofcom WLR Defence, Annex, §24.
[222]Ofcom WLR Defence, Annex, §54.
[223]Ofcom WLR Defence, Annex, §§57–59.
[224]Ofcom WLR Defence, Annex, §61.

BT's Intervention

2.190 Until March 2009, BT had [225] plans to migrate its WLR products and its calls products on to the 21CN. However, BT now expected the PSTN, and the associated line cards using TDM technology, to be in service for long after the end of the current charge control period. This was disclosed to industry in March 2009. Mr Esslin-Peard stated[226] that this reflected the company's ability to maintain its PSTN network at a lower cost than initially expected, as well as the advent of fibre-based broadband and associated voice services and the overall changed economic outlook.

2.191 BT argued[227] that, given the increasingly complex voice needs of the market, a systematic migration of PSTN services to NGN was unlikely to meet changing market requirements and, potentially, the scale at which BT must operate.

2.192 BT argued[228] that a technology had to be technically and commercially viable and lower cost to justify being the MEA, and at the present time NGN would fail such a test for voice services.

2.193 Mr Tickel argued[229] that the change in BT's strategy away from 21CN was not driven by any desire to avoid moving BT to an MPF basis. In fact, the current low price of MPF provided a somewhat distorted incentive for operators to switch to an MPF basis, and BT remaining on WLR+SMPF created an inbuilt handicap for BT's retail business as it competed against MPF-based competitors that were effectively subsidized by the low price of MPF. Rather, BT's decision to change its strategy for voice services was motivated by a recognition that large-scale investment in new technology to support traditional voice services was an increasingly risky investment. This reflected both the wider investment climate and also a background of increasing uncertainty as to the future scale and duration of demand for traditional voice access services.

CPW's Reply V (29 March 2010)

2.194 In response to Ofcom's 'technology-neutral' argument, CPW argued[230] that this was post-hoc rationalization by Ofcom since nowhere in the WLR Decision (or LLU Decision) did Ofcom refer to a 'technology-neutral' approach.

2.195 In addition, CPW argued[231] that there was nothing 'technologically neutral' about setting the structure of prices based on legacy technology in circumstances where there was an alternative (and more efficient) technology. CPW argued that it was no more or less a judgement about a particular technology to use for this purpose than doing so on the basis of NGN technology.

2.196 CPW also argued[232] that Ofcom failed to define what it meant by 'established' (see paragraph 2.179 above). If Ofcom meant 'once adopted by the regulated incumbent monopoly', CPW considered that such an approach was wrong in principle.

2.197 In response to Ofcom's argument that using legacy costs would protect consumers from excessive charges which arose from the use of NGN technology, CPW

[225] BT W/S Esslin-Peard II, §25.
[226] BT W/S Esslin-Peard II, §26.
[227] BT W/S Esslin-Peard II, §28.
[228] BT W/S Esslin-Peard II, §28.
[229] BT W/S Tickel, §30.
[230] CPW Reply V, §14.1.
[231] CPW Reply V, §14.3.
[232] CPW Reply V, §14.4.

suggested[233] that using NGN technology as the basis for setting price differentials should lead to lower prices overall for consumers, as supported by the view of the ERG.

2.198 Mr Heaney noted[234] that BT itself considered NGN to be 'commercially-proven', and NGN costs to be lower, as it included NGN costs in its CCA FAC estimates (prepared for the second consultation, eg Annex, §10.79). Mr Heaney suggested[235] that the delay in BT's roll-out plans accounted for the shift in Ofcom's view in the WLR Statement that legacy costs should be used to calculate BT's costs.

2.199 As evidence that the NGN was the MEA, CPW noted[236] that CPs were expanding their NGN networks and were migrating existing customers off legacy networks on to NGNs. For instance:

(a) TalkTalk had been operating an NGN for almost four years and was moving customers from legacy networks to its NGN network.

(b) Sky was migrating customers from legacy networks to its NGN network in 2009.

2.200 CPW argued[237] that Ofcom's suggestion that basing costs on a new technology could create windfall gains or losses for an incumbent suffered from a number of flaws:

(a) BT's total return did not depend on the structure of prices, but on total costs recovery, and there was thus no risk of windfall gains or losses arising in the present context.

(b) BT's choice of technology should not affect the price control, because each price control should be set on the basis of the most efficient forward-looking costs, irrespective of whether the incumbent monopolist was.

(c) Ofcom's approach of determining costs based on BT's actual behaviour would tend to distort incentives, since BT would know that moving to NGN technology would cause Ofcom to consider that NGN technology was thereby 'established', leading to a reduction in the allowable total costs from those based on older, less efficient technology. This would reduce the returns from that investment and act as a disincentive to adopting the more efficient technology.

2.201 In response to Ofcom's argument that the methodology for taking account of technology should be consistent across regulatory price-setting decisions, CPW argued[238] that Ofcom's approach was a 'recipe for regulatory paralysis' on the basis that this argument would mean that the methodology would never be changed.

2.202 CPW argued[239] that there was no credible case to suggest that NGNs were not sufficiently commercially proven to constitute the MEA. CPW suggested that BT's choice as to the speed at which it rolled out its NGN could not be taken to be determinative of, or even particularly relevant to, whether the technology was sufficiently proven to constitute the MEA.[240]

[233]CPW Reply V, §14.2.
[234]CPW W/S Heaney VII, §13.
[235]CPW W/S Heaney VII, §15.
[236]CPW Reply V, §17(c).
[237]CPW Reply V, §19.
[238]CPW Reply V, §30.
[239]CPW Reply V, §32.3
[240]CPW W/S Heaney VII, §§20–22.

2.203 In response to Ofcom's argument that it was difficult in practice to estimate costs for a new technology, Dr Houpis argued[241] that this would be no more difficult than forecasting a number of key drivers of future costs, such as efficiency gains or the volumes of lines. Dr Houpis noted that Ofcom had access to, and had used, NGN costs and had undertaken similar exercises of forecasting the costs of new technology in the recent past.

2.204 Dr Houpis argued[242] that at the time of setting the price control there was a significant amount of evidence on which to conclude that the NGN technology was well used, and that the deployment of NGNs would lead to lower costs.

2.205 Dr Houpis noted[243] that Ofcom seemed to be linking the timing of its decision about when to use NGN costs to set prices to when BT deployed its NGN, and argued that this would create a disincentive for BT to invest in the new technology, as BT would expect that a faster move to the new technology would trigger Ofcom to set new, lower prices. Ofcom's proposal therefore, by establishing a link between the use of the NGN technology costs to set prices and the actual deployment of NGN by BT, increased the risk of a technologically non-neutral approach, by prolonging the use of a legacy, inefficient technology.

2.206 Dr Houpis argued[244] that linking the timing of Ofcom's decision to the use of NGN costs to set prices to BT's deployment decision (if applied more generally beyond merely the structure of prices) created a disincentive for BT to invest in the new technology, as BT would expect that a faster move to the new technology would trigger Ofcom to set new, lower prices.

2.207 Dr Houpis considered[245] that CPW's proposal of using the MEA to calculate the differential between the costs of MPF and WLR in 2012/13 remained a superior approach to Ofcom's approach of using legacy technology, because:

(a) CPW's approach minimized the risk of creating a distortion in the relative price of MPF, and WLR+SMPF, by pricing WLR unduly low, through the use of a legacy technology;

(b) it allowed BT to recover fully its costs; and

(c) it provided the correct economic signals to entrants using access to BT's infrastructure, in terms of their decisions to invest in the efficient technology for the provision of retail voice and voice + broadband services.

2.208 Dr Houpis argued[246] that as long as Ofcom did not induce an expectation that investments in efficient technology would reduce the return which a regulated company could earn, or that such investments could not be expected to lead to adequate returns to justify them, the estimation of costs used for setting prices should not affect the regulated company's incentives to invest efficiently. As such, Dr Houpis suggested that if the delivery of services by the use of a new technology could be expected with a reasonable degree of confidence to be cheaper than using existing technology, then setting the prices according to a regulator's best estimate of the future costs of the new, or a combination of old and new, technology should make no difference to the incentives of the regulated company to switch to using the more

[241] CPW W/S Houpis VI, §9(a).
[242] CPW W/S Houpis VI, §21.
[243] CPW W/S Houpis VI, §18.
[244] CPW W/S Houpis VI, §9(c).
[245] CPW W/S Houpis VI, §9(d).
[246] CPW W/S Houpis VI, §17.

efficient technology, compared with setting prices according to the costs of the legacy technology.

2.209 Dr Houpis argued[247] that the approach proposed by Ofcom had no more superior efficient investment promotion properties (or was no more 'technology neutral') than the approach proposed by CPW, as NGN was a sufficiently established technology with known and lower costs.

2.210 Dr Houpis stated[248] that Ofcom's argument that using TDM costs promoted productive and dynamic efficiency was only valid if estimating the cost of the legacy technology was subject to less uncertainty than NGN. Dr Houpis argued that because there was no readily observable market information for TDM equipment, there was no reason to expect that Ofcom's estimates of costs using TDM equipment would be a more accurate estimate of the forward-looking incremental costs than an NGN estimate.

2.211 Further, CPW argued[249] that an MEA approach should be followed in relation to the setting of the differential between MPF and WLR (and between MPF and WLR/SMPF) for economic efficiency reasons, whilst ensuring that BT recovered its efficiently-incurred costs. Dr Houpis argued that the risk from the setting of the differential in charges between WLR and MPF, and MPF/SMPF to reflect the MEA leading to windfall gains or losses when charges were reset, as Ofcom seemed to be arguing, was at best negligible.

2.212 In response to Ofcom's assertion that the use of legacy technology costs would result in lower prices for consumers, Dr Houpis argued[250] that this was not likely to be the case because it would increase the likelihood of BT continuing to use the legacy technology for longer, implying higher costs for consumers purchasing voice and broadband services in the long run and a risk of reducing the effectiveness of deeper network-based competition as it would deter investment in, for instance, MPF-based competition.

2.213 Dr Houpis suggested [251] that Ofcom's approach of setting charges for WLR customers below incremental cost, given the need for overall cost recovery, would lead to a competitive distortion in favour of customers taking only voice services from the NGN, and hence CPs using WLR +SMPF.

2.214 In respect of the question as to whether NGN technology was more efficient, Mr Heaney noted that:[252]

(a) Ofcom had said previously that NGNs were lower cost;

(b) the ERG recognized that NGNs were more efficient;

(c) BT itself estimated the savings from moving to an NGN at £1 billion a year; and

(d) other operators were already using NGNs, expanding their NGN networks and were migrating existing customers off legacy networks on to NGNs.

[247]CPW W/S Houpis VI, §24.
[248]CPW W/S Houpis VI, §25.
[249]CPW W/S Houpis VI, §33.
[250]CPW W/S Houpis VI, §38.
[251]CPW W/S Houpis VI, §43.
[252]CPW W/S Heaney VII, §17.

2.215 Mr Heaney noted[253] that it would not be correct to reach a conclusion on the most efficient technology based solely on BT's roll-out decision. He argued that the reasons BT delayed its NGN roll-out were not driven by any doubt as to the efficiency of NGNs, but rather by other factors including BT's prioritization of capital expenditure in other areas (ie NGA), BT's labour policy, technical problems in supplying voice technology and also BT's ability to 'game' the regulatory system.

2.216 Mr Heaney argued[254] that these factors demonstrated that BT's decision to delay its NGN roll-out could not be relied upon as invalidating the conclusion that NGN technology was the most efficient technology. Instead, Mr Heaney suggested that evidence overwhelmingly indicated that NGNs were the most efficient technology, and Ofcom's approach of basing BT prices on the technology that BT was using was tantamount to saying that if BT was not planning to be efficient, then it could recover inefficient costs.

2.217 Mr Heaney suggested[255] that Ofcom had misinterpreted the Byatt Report in concluding that it was necessary to reduce the cost of an NGN line card to adjust for its higher functionality. Mr Heaney argued that the Byatt report did not say that 'allowing for differences' necessarily meant adjusting downwards by removing the value of the extra functionality, or that this would be appropriate in a context such as the present. Mr Heaney suggested that the report should be interpreted as saying that the cost of replacing a TDM/PSTN line card with a 'technically up to date new one with the same service capability' was the full cost of an NGN combi-line card.

2.218 Dr Houpis suggested[256] that Ofcom seemed to argue that it would be efficient for the prices of the fixed technology to be based on a level of costs that was (inappropriately) low, because it reflected the opportunity cost of the use of the TDM technology, which was low, given the fact that the TDM technology was no longer the MEA. Dr Houpis argued that this argument suggested that although a technology was obsolete, there was still some economic life left in it so the regulator should not set prices on the basis of forward-looking costs of delivering the service. Dr Houpis argued that while this might deliver some short-term benefits in terms of lower prices for WLR, it would provide a disincentive for BT to invest in the more efficient NGN.

CPW's WLR bilateral (30 April 2010)

2.219 At its hearing, CPW said that it would not be appropriate to reflect what an efficient new entrant would do because a new entrant would be 100 per cent NGN from the start. Mr Heaney said:

> I think obviously the fact it that a new entrant would not have to make any of these migrations across so they would start with 100 per cent NGN on day one whereas BT needs to go through a migration programme just as mobile operators go through from a 2G to a 3G migration programme. So, I think it would take a number of years before they could move to this new thing.[257]

2.220 CPW said that Ofcom's approach had been to base price controls on the technology that BT was using or was planning to use. Mr Heaney said:

---

[253] CPW W/S Heaney VII, §§20 & 21.
[254] CPW W/S Heaney VII, §23.
[255] CPW W/S Heaney VII, §82.
[256] CPW W/S Houpis VI, §47.
[257] CPW hearing transcript, 30 April, p62, lines 21–28.

> I think the concept of what standard or what technology to use to work out the efficient cost in our view should not be based on what BT or indeed what we happen to be doing … It is based on a generic assessment of what the most efficient technology is because the problem is … that by doing what Ofcom does, which is basing the technology on what BT is doing or planning to do, actually it is both not technology neutral because it is quite technology specific bit is also gives BT a disincentive to actually innovate and become efficient because they know that they can actually recover inefficient costs.[258]

2.221 CPW gave some possible reasons unrelated to efficiency considerations as to why BT delayed the roll-out of NGN, as BT had a policy of no compulsory redundancies which restricted its ability to benefit from the efficiency savings promised by NGN.[259]

2.222 CPW said that whilst Ofcom did not 'have to follow word by word what ERG says, the ERG provides good guidance in the absence of anything clear from Ofcom'.[260]

Ofcom's WLR bilateral (6 May 2010)

2.223 At its hearing, Ofcom said that the MEA might be a wireless network or a fibre-to-cabinet network or a fibre-to-premises network. Mr Culham said, 'another question is: what is MEA? That is particularly relevant to this case because in the access network it is not entirely clear what the MEA would be. It might be a wireless network, it might be a fibre-to-cabinet network; it might be a fibre-to-premises network'.[261]Ofcom spoke to a number of slides, including a slide which stated: 'Incentive for Productive and Dynamic Efficiency Technology Neutrality vs MEA'.[262]

2.224 Ofcom told us that

> the evidence seems to be from a number of different countries that operators have found that the NGN in principle offers a great deal of benefits, and they have been able particularly to take advantage of that in core networks. However, when it's come to replicating a lot of the existing legacy services and migrating people from those services to the new networks, that has been a more challenging experience than they have expected. Now that's a conclusion that BT have come to. I think there have been [sic] somewhat similar experience in other countries as well.[263]

2.225 Ofcom stated that both FTTC and FTTP would make investment in MSANs redundant.[264]

2.226 Ofcom said[265] that although it attached considerable significance to the ERG advice, ultimately it was not bound absolutely by it.

2.227 Ofcom said[266] that it could not identify the MEA, apply it 'mechanically', and set a price for a number of reasons, for example holding losses, the cost of migration, and

---

[258]CPW hearing transcript, 30 April, p36, lines 12–24.
[259]CPW hearing transcript, 30 April, p58, lines 31&32, p60, lines 1-26.
[260]CPW hearing transcript, 30 April, p49, lines 24–32.
[261]Ofcom hearing transcript, 6 May, p6, lines 31–36.
[262]Ofcom WLR bilateral hearing slide pack, slide 6.
[263]Ofcom hearing transcript, 6 May, p35, lines 9–25.
[264]Ofcom hearing transcript, 6 May, p16, lines 1–5.
[265]Ofcom hearing transcript, 6 May, p11, lines 13–23.
[266]Ofcom hearing transcript, 6 May, p6, lines 13–30.

parallel running. Ofcom said that this was particularly true in times of changing technology.

2.228 Ofcom believed[267] that the choice of efficient technology should be made by the firm rather than the regulator. However, Ofcom wanted to set up arrangements that allowed the firm to gain the benefit of minimizing its costs and moving to a more efficient technology.

2.229 Ofcom believed[268] that it should not second guess the industry as to what the most efficient fundamental technology was for the future deployment of the network.

2.230 Ofcom asserted that whatever the approach to technology, it must be adopted consistently across all regulated services affected by CPs' decisions as to which technology to use. If not, it could create unanticipated holding losses, which would be undesirable for regulatory stability and investment incentives.[269]

2.231 Ofcom considered[270] that, if a TDM asset was considered to be the MEA, there were a number of ways to estimate how the network should be maintained going forward.

2.232 Ofcom said[271] that the view within the industry was that the fundamental economics of rolling out fibre into the local access network had changed in a period of only four or five years.

2.233 Ofcom's view[272] of BT's investment plans was that BT planned to move to a multi-service network but encountered so many problems that it reassessed its plans and instead focused on FTTC and FTTP.

BT's WLR bilateral (12 May)

2.234 BT said[273] that its planned investment in NGN line cards did not go ahead because it had a view that using the existing line cards was more efficient. BT indicated that, in part, this was because it was likely that the next generation of voice services would be fibre based. At its hearing, BT told us that:

> We announced plans in March 2009 to scale back the roll out and migration of WLR. I think you may have seen reference to the Path Finder trials in South Wales and a number of lines that we were looking to move across. I think that has now sort of 'paused'. So we still have those lines running, and we have about [✂] lines in South Wales, but that's where it got to.[274]

Sky's WLR bilateral (13 May 2010)

2.235 Sky believed[275] that NGN was the most efficient technology, and argued that having the ability to merge all your products and services on to a single network had scale and scope economies, irrespective of the size of your network.

[267] Ofcom hearing transcript, 6 May, p38, lines 3–9.
[268] Ofcom hearing transcript, 6 May, p36, lines 2–6.
[269] Ofcom hearing transcript, 6 May, p7, lines 9–14.
[270] Ofcom hearing transcript, 6 May, p66, line 32 to line 15 on p67.
[271] Ofcom hearing transcript, 6 May, p13, lines 13–37.
[272] Ofcom hearing transcript, 6 May, p15, lines 12–36.
[273] BT hearing transcript, 12 May, p24, lines 5–22.
[274] BT hearing transcript, 12 May, p24, lines 27–29, and p25, lines 1–4.
[275] Sky hearing transcript, 13 May, pp14&15, lines 16–30.

2.236 In terms of BT's incentives to invest in new technology, Sky said:

> BT have a very old voice network and do not spend much money on it in terms of capex, but they have slightly higher opex to look after the ageing voice network. In doing that effectively BT get a return on their old voice network and it is very cash flow positive for them. It is fully depreciated. It is money for old rope to some extent, so they are sitting on a high margin cash flow positive business and they are capex constrained. They are presented with the choice of replacing it with something that cedes margin control and they have only a certain amount of money to spend and have more appealing projects. All in all, it makes it quite easy for them to take the foot off the pedal in terms of NGNs and converged networks and invest elsewhere.[276]

2.237 Sky also noted that Virgin had chosen not to invest fully in an NGN for voice, and continued to use PSTN assets primarily because BT's prices set by Ofcom filtered through into what everyone else could earn or pay in terms of moving calls from their network.[277]

2.238 Sky said[278] that the new fibre-based products were pushing them away from their previous MPF-based model, towards a WLR CPS plus fibre-based broadband model.

2.239 With regard to overseas examples, Sky noted:

> what alternative European incumbent telecoms operators have done. France Telecom is a very good example. They are a lot further down the route than BT. Different companies have different reasons for doing things. One of the nuances is that one tends to find other incumbent fixed operators have a mobile business. BT do not have such a business. I think that is one of the factors that has played into their thinking around the extent to which they should go into NGN, but that should not be related to the fact that it is the most efficient way of building a network if you are starting from the ground up.[279]

CPW's Reply VI (21 May 2010)

2.240 With reference to Reply VI (Submissions by CPW on Confidential Materials disclosed by BT), CPW stated that the disclosed documents contained a 'myriad' of references to the benefits to BT of moving to NGN, and to the cost savings that BT hoped to achieve by doing so. CPW noted that the documents made clear that:[280]

(a) BT had done no more than delay its planned roll-out.

(b) The reason for this delay was that 'The funding required for delivery of the current plan ... based on national migration to complete by December 2010, is substantial, and both the extent and timing of expenditure cannot be reasonably justified by BT given the current economic environment'.

[276] Sky hearing transcript, 13 May, p17, lines 18–31.
[277] Sky hearing transcript, 13 May, p19, lines 24–30.
[278] Sky hearing transcript, 13 May, pp25&26, lines 27–31.
[279] Sky hearing transcript, 13 May, p17, lines 4–15.
[280] CPW Reply VI, §34.

2.241 CPW noted[281] that the documents made no suggestion that NGN was not the MEA. Additionally, CPW argued[282] that the documents supported CPW's position that the decision to delay roll-out had been caused or contributed to by factors internal to BT, such as poor-quality installations, weaknesses in migration plans and delivery systems.

Ofcom's Response to Reply VI

2.242 In its response to CPW's Reply VI, Ofcom[283] stated that it did not agree that the documents supported CPW's position. Ofcom argued[284] that there was no evidence in the documents to suggest that the delay in BT's roll-out was because 'NGN is not the MEA'.

2.243 Ofcom did not consider[285] that the document supported the view that NGN technology in the access network was the established technology, or a clear efficient technological choice for access services. In particular, Ofcom argued that the documents made clear that while the backbone elements of 21CN were continuing to be developed (albeit this development had been delayed), there was an indefinite suspension of the access voice products (Wholesale Broadband Connect Converged (WBCC) and Wholesale Voice Connect (WVC)) as these had proved to be uneconomic, and that BT needed to explore options presented by new technology, which would include NGA.

BT's response to Reply VI

2.244 In response to CPW's Reply VI, BT argued[286] that the documents did not shed any new light on the question of whether 21CN was the MEA. BT said that the documents cited by CPW simply confirmed the position as BT had previously explained it, which was that BT decided to delay the roll-out of 21CN for voice because it believed that NGN was not the efficient way to proceed in the (then) current climate.

2.245 In response to CPW's assertion that the BT's decision to delay roll-out had been caused by factors internal to BT, BT argued[287] that this information simply identified risks associated with 21CN roll-out, and the existence of such documents in connection with a substantial migration from one technology to another was not surprising.

CPW's letter of 12 May

2.246 CPW agreed[288] that, overall, the ERG guidelines on the application of MEA were 'not so helpful' in the current context.

2.247 Instead, CPW said[289] that it was instructive to go back to first principles and consider the objective of the price control, that is, to mimic a competitive market and send correct price signals to efficient new entrants. In that case, CPW said that the appropriate cost standard was the efficient forward-looking LRICs (plus a mark-up).

[281] CPW Reply VI, §34.
[282] CPW Reply VI, §35.
[283] Ofcom response to Reply VI, §23.
[284] Ofcom response to Reply VI, §24.
[285] Ofcom response to Reply VI, §25.
[286] BT Response to Reply VI, §50.
[287] BT Response to Reply VI, §53.
[288] CPW letter to the CC, 12 May 2010.
[289] CPW letter to the CC, 12 May 2010.

CPW believed that, in that case, the efficient network to operate in the long run was an NGN (even though BT may in the short run decide to continue its legacy network). Further, CPW believed that NGN costs should not be abated (eg by sharing cost of line card with broadband or usage) since, if they were so abated, the resultant cost would not represent the incremental cost caused in providing the service, and would imply that a new entrant, even if it was efficient, would not be able to trade profitably in the provision of voice services to voice-only customers, based on the use of MPF. This 'no sharing' approach was consistent with Ofcom's approach to covering the cost of the copper loop where there was no sharing of the loop cost with broadband or calls and all the cost was recovered from WLR.

Ofcom's WLR hearing (6 May 2010)

2.248 At its hearing, Ofcom told us that single jumpering did not exist, so setting the price on that basis would seem like a rather strange thing to do.[290] Ofcom said that until this appeal no CP at any time had ever suggested that this current wiring arrangement was inefficient.[291]

BT's WLR hearing (12 May 2010)

2.249 At its hearing, BT said that single jumpering was not cheaper, it was not more effective and other CPs had not requested it.[292]

BT's letter of 19 May 2010

2.250 In response to Mr Heaney's assertion[293] that 'NGNs are proven ... they are more efficient', BT said[294] that while NGNs offered some benefits in the core network this was not relevant to the charge control. BT considered that what was relevant was the impact of NGN on WLR costs, and in this context, it did not consider NGN to be more efficient.

CPW's letter of 25 May 2010

2.251 CPW emphasized[295] that it was not appropriate to determine the most efficient technology by reference to the behaviour of the dominant incumbent and ignore the behaviour of other market participants.

Estimation of LRIC—calculations

2.252 This part provides a brief summary of the key areas where CPW claimed[296] Ofcom had erred in calculating the LRIC cost differential, including in respect of:

(a) allocation of line-card costs;[297]

[290] Ofcom hearing transcript, 6 May, p75, lines 11–25.
[291] Ofcom hearing transcript, 6 May, p76, lines 27–35.
[292] BT hearing transcript, 12 May, p35, lines 3–15.
[293] CPW WLR bilateral transcript, p29, line 27.
[294] BT letter to the CC, 19 May 2010, Comments on CPW transcript.
[295] CPW letter to the CC, 25 May 2010, Comments on CPW transcript.
[296] 27 April 2010 CPW letter to the CC, p2.
[297] CPW W/S Houpis III, §§57–59.

(b) servicing and fault repair cost difference;[298]

(c) migration costs;[299]

(d) wiring, frame costs and tie cable allocations;[300] and

(e) product management cost difference.[301]

2.253 In addition, a brief summary of CPW's estimation of the appropriate differential is provided.

2.254 CPW supplied an estimate of the differential between the LRICs of providing MPF and providing WLR or WLR +SMPF in Mr Heaney's first witness statement. However, this analysis did not provide a basis for estimating charges that had a differential equal to LRIC+EPMU (as CPW stated was appropriate). However, CPW said[302] that given access to the Oak model they would be able to do so.

2.255 The Ofcom CCA FAC model was provided to CPW which it used to further its arguments on several aspects of the LLU case.[303] Having noted that CPW had not in its Reply V said what the charges should be, or how they should be calculated, the CC asked CPW what it was asking us to do if we were to accept its arguments in relation to the structure of charges.

2.256 Frontier, on behalf of CPW, provided[304] a report to the CC on 27 April 2010 which outlined CPW's view on the estimate of LRIC+EMPU cost differences. This report (and the underlying model subsequently provided to the confidentiality ring) revised Mr Heaney's previous estimate of LRIC differentials.[305] CPW indicated that its estimate had been revised in light of Ofcom's financial models, which had previously been unavailable to CPW.

2.257 CPW provided the (slightly revised) model underlying the LRIC+EPMU calculations on 20 May and a further (amended) version of the model on 1 June. CPW stated that the Frontier model figures superseded the figures provided by Mr Heaney in the witness statement attached to the LLU NoA.[306]

Line cards

Ofcom's Decision

2.258 As summarized by Ofcom,[307] line cards were the electronic equipment that telephone lines connect to in the local exchange. They represented an important input for WLR but were not required for the provision of MPF. BT used TDM technology. This involved PSTN line cards that only recognized voice traffic. The costs were therefore directly attributable to WLR services.

---

[298] CPW W/S Heaney VII, §68.
[299] CPW W/S Houpis III, §§60–68.
[300] CPW W/S Heaney VII, §31.
[301] CPW W/S Heaney VII, §62.
[302] WS Heaney I, Annex I, and WS Houpis I, §88.
[303] See, for example, WS Houpis II.
[304] CPW letter to the CC, 27 April 2010.
[305] CPW W/S Heaney I, §89.
[306] CPW transcript, 30 April, p87, lines 19–29.
[307] WLR Statement, §5.32.

2.259 At the time of the Second Consultation, BT planned to replace most PSTN line cards with 'combi cards' (using MSANs), which could be used by multiple products or services in three ways:[308]

(a) to generate a voice-only service, using only the voice capability of the card (currently WLR);

(b) a data-only service using only the data capability of the card (BT did not currently provide such a service); or

(c) a voice and data service using the full capability of the card (currently WLR and broadband).

2.260 Openreach estimated the line-card cost to be recovered via the WLR charge on the basis of the number of services provided. Ofcom considered[309] that this methodology was reasonable and, compared with the results reported in previous Regulatory Financial Statements, the resulting unit cost values were also considered reasonable.

2.261 After BT suspended its plans for the roll-out of 21CN, Ofcom considered[310] the case where BT replaced PSTN cards with combi cards. In this case, Ofcom said that the charges for combi-card use needed to reflect *(a)* that they were installed to support both voice and broadband services, and *(b)* that the move to combi cards was necessary only if the network was required to support more services than just voice.

2.262 In Ofcom's view,[311] three principles were relevant to the question of how these costs should be recovered. They were consumer protection, incentives to invest in efficient cost-reducing technology, and the efficient choice of inputs:

(a) In relation to the issue of customer protection, Ofcom considered[312] that it would be inefficient for an investment in new lower-cost technology to result in customers having to pay more for their service than they did previously. This suggested that it would be equitable and efficient to cap the charge for the combi card when used for voice at the cost of continuing to provide voice services over the dedicated voice network.

(b) In relation to investment incentives, Ofcom considered[313] that cost-reducing investment was induced if prices were left unchanged by the introduction of new technology, as this gave the firm an incentive to minimize costs. By contrast, if the introduction of new technology were allowed to lead to higher charges, inefficient investment could be encouraged.

(c) In relation to the issue of the efficient choice of inputs, Ofcom believed[314] that it was important that the charging arrangement was consistent with the minimization of the total costs of providing voice and broadband services. This implied that the charge for a combi card for voice-only services should be capped at the cost of providing voice services (ie a PSTN line card). If the charge were set above this level, CPs could be induced to use MPF and install a PSTN line card. This could lead to the total cost of cards, including subsequent upgrades of lines

[308]WLR Statement, §5.33.
[309]WLR Statement, §5.36.
[310]WLR Statement, §5.39.
[311]WLR Statement, §5.39.
[312]WLR Statement, §5.40.
[313]WLR Statement, §5.41.
[314]WLR Statement, §5.42.

for broadband, being greater than if combi cards were installed on all lines in anticipation of a significant number of lines being upgraded to broadband.

2.263 Based on this analysis, Ofcom decided[315] that it would be appropriate to cap the costs recovered from voice-only customers at the level that would be implied by hypothetical continued use of the existing TDM technology.

CPW's Appeal

2.264 CPW claimed[316] that Ofcom continued to base its LRIC cost estimates on a mix of TDM and NGN technology even after BT suspended its plans to roll out its 21CN network over the time frame of the price controls.

2.265 CPW argued that Ofcom failed[317] to adopt a reasonable and reliable basis for determining line-card costs which was available to it, which would have shown that its WLR costs were underestimated.

2.266 Dr Houpis suggested[318] that Ofcom's objective of maintaining stable access charges could have been achieved by estimating the cost of line cards using a depreciation methodology that would better approximate economic depreciation. For mobile networks, which also have this characteristic as investment is concentrated in the period when each generation of network is being rolled out, Ofcom chose to use economic depreciation, which attempted to ensure that unit capital charge movements reflected underlying movements in the replacement cost of assets.

2.267 Dr Houpis noted[319] that the key element of WLR costs, over and above those costs which were also relevant to the MPF service, were represented by the line-card costs. Dr Houpis suggested that the relationship between the number of active access lines connected to the network and the number of line cards required was essentially linear, and was unrelated to the traffic generated over these access lines. Due to this relationship, line-card costs could be considered to be incremental with respect to the number of access lines, and hence for reasons of allocative efficiency were recovered from the WLR access service.

2.268 Dr Houpis also argued[320] that CCA depreciation, as implemented by BT, resulted in capital charges for individual assets falling over the lifetime of the asset as capital employed fell, with the depreciation charge remaining constant. Such assets which remained in service past the end of their assumed useful lives generated no capital charge, as the capital employed was zero and there was no depreciation charge.

2.269 CPW argued[321] that it was likely that the majority of line cards in operation were either: *(a)* reaching the end of their economic lives, with the result that capital charges were relatively low; or *(b)* at the end of their economic lives, with the result that capital charges for these line cards were zero. As a result, the level of CCA capital charges would be below the true economic capital costs of operating these line cards. To the extent that other indirect and common costs were assigned on the basis of mark-ups on these (direct) capital charges, the level of these common costs allocated to line cards would be similarly underestimated.

[315]WLR Statement, §5.43.
[316]CPW WLR NoA, §105.3.
[317]WLR NoA, §105.2.
[318]CPW W/S Houpis III, §§53 & 54.
[319]CPW W/S Houpis III, §50.
[320]CPW W/S Houpis III, §50a.
[321]CPW W/S Houpis III, §50(g).

2.270 Dr Houpis noted[322] that for many asset classes where network elements were installed and replaced on a relatively continuous basis, the aggregate charge across all assets might be considered to be a reasonable proxy for the true economic depreciation, as the relatively high charges for recently installed assets were offset by lower capital charges for assets reaching the end of their assumed lives. In addition, the zero capital charges for assets which remained in operation past their assumed asset lives were offset by charges for retirements for assets which were removed from service before the end of the assumed life.

2.271 In summary, Dr Houpis argued[323] that setting prices on a forward-looking basis using CCA FAC costs would be inefficient as even an operator as efficient as BT would not be able to recover investment in equivalent TDM equipment over the lifetime of the line cards if the cost recovery was set below the level of economic costs.

2.272 Dr Houpis[324] noted that Ofcom used the assumption that 21CN line-card costs should be attributed to customers on the basis of the number of services used by customers (with narrowband access and broadband access being separate services). The number and hence costs of line cards were proportional to the number of access lines rather than to the services used over these access lines. The effect of this cost attribution methodology was that some of the line-card cost was recovered from, for instance, broadband service irrespective of whether the line was used to offer broadband services or not. This was also inconsistent with Ofcom's approach of recovering subscriber-sensitive costs fully in the line rental charge. The correct approach of recovering the whole cost of the line card in WLR was recognized in the LLU Statement, where Ofcom used the full costs of the line card to estimate LRIC differentials. However, the LRIC differential in the WLR Statement[325] was based on the inappropriate attribution methodology.

2.273 In addition, CPW noted[326] that there was some evidence suggesting that the useful economic lives assigned to TDM line cards could have been significantly underestimated.

Ofcom's Defence

2.274 For the CCA FAC figures, Ofcom[327] had used line-card estimates resulting from BT's forecast mix of PSTN line cards (based on TDM technology) and a per-service allocation of 21CN combi-cards (based on NGN technology) as a proxy for the costs of continuing with PSTN line cards. Ofcom considered that this was a reasonable proxy as it gave per-line costs within the range of PSTN line-card costs in the regulatory accounts in recent years, and were broadly constant in real terms compared with current costs.

2.275 Dr Houpis[328] argued that these figures were likely to underestimate the appropriate depreciation for line cards, as they were already heavily depreciated. However, Ofcom[329] noted that PSTN line cards were depreciated over a ten-year life and in 2007/08, PSTN line cards were probably just past their steady state and were starting to be heavily depreciated.

[322]CPW W/S Houpis III, §50.
[323]CPW W/S Houpis III, §50(h).
[324]CPW W/S Houpis III §57.
[325]WLR Statement, §5.44.
[326]CPW W/S Houpis III, §50(f).
[327]Ofcom WLR Defence, Annex, §66.
[328]CPW W/S Houpis III, §§48–54.
[329]Ofcom WLR Defence, Annex, §67.

2.276 To consider the LRIC costs of a line card, Ofcom started from the assumption that the LRIC figures would be around 90 per cent of the CCA FAC number, in line with the ratio in BT's regulatory accounts. If this ratio were to continue to hold when the CCA FAC figure was forecast to be £12.30 in 2012/13, it would imply a LRIC of around £11 per line card. However, Ofcom[330] explicitly recognized that it was possible that this may understate the LRIC cost because the depreciation component might be understated. It therefore considered a range that involved increasing the upper end of the LRIC cost to £13.

BT's Intervention

2.277 Mr Dolling agreed[331] with Ofcom that the regulatory financial statement (RFS) estimate of the LRIC for the line-card component was about 90 per cent of the FAC estimate.

CPW Reply V (29 March 2010)

2.278 Dr Houpis doubted[332] the accuracy of the Ofcom LRIC estimate on the basis that Ofcom applied a 10 per cent reduction to the CCA FAC value for TDM line cards, and also then applied an unclear and unsourced upwards adjustment because 'the depreciation component might be understated'.

2.279 Dr Houpis considered[333] that Ofcom's approach could not be relied upon because:

(a) where it had used NGN technology it had not allocated all of the combi-card cost to WLR and therefore the cost used did not represent the LRIC cost rather than basing the incremental line-card costs on an NGN and the full cost of the combi-card;

(b) it had not fully used the correct technology (NGN); and

(c) it had underestimated depreciation.

BT's letter of 19 May 2010

2.280 BT did not[334] agree that NGN line cards were, for the moment at least, a more efficient way to deliver voice services.

Servicing and fault repair

Ofcom's Decision

2.281 With regard to fault rates, Ofcom estimated[335] these based on Openreach's actual experience of reported faults, which showed overall MPF having more faults than WLR. While Ofcom acknowledged that CPW did provide evidence that faults on its WLR lines were higher than on its MPF lines, Ofcom did not consider CPW's experience representative of lines as a whole.

[330]Ofcom WLR Defence, Annex, §69.
[331]BT W/S Dolling I, §94(e).
[332]CPW W/S Houpis VI, §51.
[333]CPW W/S Houpis VI, §52.
[334]BT letter to the CC, 19 May 2010, Comments on CPW transcript.
[335]WLR Statement, §§5.75 & 5.76.

2.282 In the WLR Statement, Ofcom noted[336] that another reason to expect MPF to have higher repair costs than WLR was that there was generally a higher standard of care associated with MPF (and also for SMPF) than WLR. In particular, the fault repair standard for an MPF line was for it to be repaired within 40 hours (Monday to Sunday), compared with 96 hours for a *WLR Basic* line.

CPW's Appeal

2.283 Mr Heaney argued[337] that fault rates on MPF should be no more than WLR because any additional faults on MPF related to broadband were not relevant. Since WLR included more elements (ie line card) then he would expect the number of faults to be higher on WLR.

2.284 Mr Heaney also noted[338] that Openreach was planning to modify its service standards under a new programme, which would result in the basic WLR product service level commitment to fix a fault by end of next working day plus one day (ie 48 to 72 hours), while the basic MPF product would have a service level commitment to fix a fault by the end of the next working day (ie 24 to 48 hours). Mr Heaney argued that because Ofcom assumed the current fault repair time rather than this new programme would result in an overestimate in the per fault repair cost as between MPF than WLR.

2.285 Mr Heaney argued[339] that because the Ofcom estimate of the fault service/repair cost appeared to use 2007/08 CCA FAC costs (and not efficient LRIC) and did not take account of other factors, such as Openreach's new standard service levels programme or differences in repair cost per fault, Ofcom's estimate was not a reliable indicator of the efficient cost difference in 2012/13.

BT's Intervention

2.286 With regard to fault rates, BT noted that MPF was in practice used to provide a bundle including both voice and broadband services (and not voice-only services) and therefore generated repair costs in both respects. BT argued[340] that CPW's omitting these faults in its calculation was entirely self-serving.

2.287 Mr Dolling disagreed[341] with Mr Heaney's comments on fault repair, and said that the MPF product had a higher incidence of fault rates than WLR and therefore fault costs flowed to MPF at a higher cost per unit than for WLR. Mr Heaney argued for a voice-only MPF product to be used for comparison purposes, but this did not reflect the product actually supplied.

Ofcom's Defence

2.288 With regard to fault rates, Ofcom suggested[342] that Mr Heaney appeared to accept that higher faults were expected on a copper line that was used for broadband than one that was used only for voice, since the broadband service was more susceptible to, and less tolerant of, faults.

---

[336] WLR Statement, §5.74.
[337] CPW W/S Heaney III, §41.
[338] CPW W/S Heaney III, §43.
[339] CPW W/S Heaney III, §49.
[340] BT WLR SoI §30(c).
[341] BT W/S Dolling III, §43.
[342] Ofcom WLR Defence, Annex, §97.

2.289 While Mr Heaney argued that when considering the differential between MPF and WLR it was necessary to assess the differences in the scenario where MPF was being used to provide a voice-only service, as opposed to voice and broadband services, Ofcom rejected[343] this assumption. Ofcom argued[344] that it would be necessary that a voice-only MPF product was actually supplied for this assumption to be valid. Ofcom noted that this might be infeasible, was probably undesirable and was not the basis on which MPF was currently sold. In contrast, Ofcom set the MPF charge to cover the costs of using MPF as it was currently used, namely to supply voice and broadband.

2.290 Moreover, Ofcom indicated[345] it was not clear that different charges for different uses of MPF was feasible, given that there would probably be a need to monitor usage to ensure the lower-priced input in only being bought when appropriate.

CPW's Reply

2.291 Mr Heaney argued[346] that the implied fault repair cost differences between MPF vs WLR/SMPF were overestimated because Ofcom's fault repair costs were based on data for fault rates from 2007 and 2008 which were unlikely to be reliable for estimating fault repair cost differences in 2012/13 because:[347]

(a) actual MPF fault rates would have reduced since 2007/08 (compared with WLR) since the MPF product was maturing;

(b) more recent data that was available to Ofcom at the time of the WLR Decision that showed the MPF fault rate (when used for broadband and voice) was to be about 10 per cent lower than the WLR fault rate;

(c) logically, it was likely that the fault rate for MPF would be lower than WLR (even when the MPF line was also used for broadband) since MPF involved fewer network elements and therefore there was 'less to go wrong'; and

(d) it might be that there were a relatively higher number of faults for MPF than WLR due to the use of the current wiring approach rather than single jumpering. Since the current wiring approach was efficient, it followed that any additional fault repair costs associated with this wiring approach were not efficient either and so should be adjusted for.

2.292 Mr Heaney argued[348] that neither Ofcom nor BT provided any reasoning to support the use of the out-of-date and inaccurate data on which they relied, especially when better data was available.

2.293 Mr Heaney agreed[349] that Ofcom correctly highlighted that the higher level of care[350] for MPF than WLR would increase the fault repair cost of MPF relative to WLR since the cost per fault was higher. Though it was appropriate to reflect this factor in the calculations, the impact it would have on incremental fault repair costs was likely to be small.

[343]Ofcom WLR Defence, Annex, §91.
[344]Ofcom WLR Defence, Annex, §97.
[345]Ofcom WLR Defence, Annex, §91.
[346]CPW W/S Heaney VII, §70.
[347]CPW W/S Heaney VII, §71.
[348]CPW W/S Heaney VII, §72.
[349]CPW W/S Heaney VII, §73.
[350]ie faster fault repair.

2.294 Mr Heaney noted[351] that fault rate data used in Ofcom's model was for MPF lines which were used to provide voice and broadband services. In the case where an MPF line was used to provide voice-only services, the fault rate and so fault repair costs would be lower; broadband made the line more susceptible to faults than a line that was only used for voice. This difference should be reflected in a lower fault repair cost for MPF in the derivation of the MPF vs WLR cost difference (ie when a line was used for voice only). This adjustment had not been made by Ofcom in its calculations since the MPF fault repair costs Ofcom used were based on MPF when it was used for voice and broadband.

2.295 Mr Heaney disagreed[352] with Ofcom that this adjustment would necessitate an MPF product with a lower price that could only be used for voice and that this would be 'infeasible' and 'undesirable' since it might result in arbitrage. Mr Heaney noted that a voice-only MPF product with a lower price could be feasible by, for instance, Openreach only providing repair on faults that were necessary to allow a voice service to be provided and not the higher level of quality that was required to provide broadband as well. In any case, Mr Heaney argued that absence of a BT product was not a reason not to set the prices correctly.

2.296 Mr Heaney suggested that it was to achieve economic efficiency that it was important that the price difference between MPF and WLR (ie when providing voice-only services) was set with reference to the actual costs incurred, which in the case of MPF must reflect the fact that the line would have a lower level of faults since it was not being used to provide broadband.

Migration costs

Ofcom's Decision

2.297 In the WLR Statement, Ofcom did not agree that WLR charge should include around £7 per line per year for migration costs because:[353]

(a) Migration costs were driven by the move from the old technology to a new technology. A new technology should not increase costs for existing users who could have continued to be served with the old technology.

(b) A key part of the rationale for NGN technology was to reduce costs in the core network by having a single voice and data network rather than two separate networks. If migration costs should be recovered at all, Ofcom said that they should be through prices of core services, and these migration costs should be recovered through cost savings from the new more efficient network, not price rises.

CPW's Appeal

2.298 CPW argued[354] that Ofcom had wrongly excluded migration costs because replacing the TDM network with an NGN network would require the disconnection of copper

[351] CPW W/S Heaney VII, §74.
[352] CPW W/S Heaney VII, §75.
[353] CPW WLR Statement, §§5.49–5.52.
[354] CPW WLR NoA, §105.4.

loops from the current TDM line cards and connecting them to the corresponding MSAN line cards.[355]

2.299 Dr Houpis[356] understood that the migration of some WLR customers to 21CN would likely lead to an increase in the costs for these customers, both due to the costs of the migration itself and also due to the (temporary) costs of adopting and refining new operating procedures. However, Dr Houpis argued that Ofcom chose to exclude the costs of migration from the calculation of the cost differential between CRS products without clearly stating the rationale for this exclusion.

2.300 CPW argued[357] that telecommunications equipment had a finite economic life and at some point must be replaced, and as migration charges were incremental to the number of users it was likely to be more efficient to recover this cost evenly across all customers rather than recovering the cost disproportionately from one or other groups of customers. Otherwise, the recovery of a subscriber-driven cost from usage charges would imply that relatively heavier users would be required to fund indirectly the migration of relatively less heavy users, which could be inefficient.

2.301 Regarding Ofcom's claim that BT would actually complete few migrations in the period, Dr Houpis said[358] that it was not clear how the actual number of migrations in the period up to 2012/13 was relevant to a forward-looking efficient cost of operating a network. The migration costs in 2012/13 should reflect what would be the rate of migration of an efficient operator up to 2012/13, and from that point forward, suitably smoothed or amortized over the life of the customer and/or equipment, rather than BT's actual plans.

2.302 To the extent that the speed and level of migration, and therefore the level of migration costs, was not affected by the way in which Ofcom determined they should be recovered, Dr Houpis argued[359] that the overall costs should be the same irrespective of the way in which they were recovered. There was therefore no question of the relevant overall charges being higher under the NGN if migration costs were recovered from WLR, compared with migration costs being recovered from usage charges, as Ofcom seemed to imply.

2.303 CPW said[360] that regarding Ofcom's claim that the customers who did not benefit should not be charged, many of the voice-only customers that Ofcom claimed would pay higher charges due to the migration would, in fact, benefit from lower costs due to the fact that they also spent on lower-cost voice calls, or would take lower-cost broadband in future.

2.304 In response to Ofcom's suggestion that it was not appropriate to recover migration costs from WLR charges because they were already being allowed for in the setting of BT's core (conveyance) charges (the network charge controls), Dr Houpis argued[361] that this did not seem a valid reason to set the WLR charges inefficiently. Dr Houpis considered that if it was efficient to recover the migration costs from WLR charges, then Ofcom should have done so in coming to a view on the appropriate level of WLR charges, noting that network charge controls could then be adjusted appropriately at the next time Ofcom reviewed the network control charges.

[355] CPW W/S Houpis III, §60.
[356] CPW W/S Houpis I, §32.
[357] CPW W/S Houpis III, §§63 & 64.
[358] CPW W/S Houpis III, §65.
[359] CPW W/S Houpis III, §66.
[360] CPW W/S Houpis III, §67.
[361] CPW W/S Houpis III, §68.

Ofcom's Defence

2.305 In response to CPW's argument that some migration costs would be incurred as a result of finite equipment lives (rather than a move to a new technology), Ofcom[362] recognized the need to include some costs as a result of maintaining the existing technology. However, these costs were likely to be small and were considered to already be included in the existing line-card costs, and not as additional items in the WLR cost stack.

2.306 Ofcom[363] also noted that it had not explicitly included migration costs in the network charge controls. Rather, it set the network charge controls on the assumption of continued use of the existing technology, and not migration to new technology.

BT's Intervention

2.307 Mr Dolling said[364] that he supported Ofcom's position that migration charges from existing to 21CN technology should be excluded from WLR costs on the basis of the 'technology-neutral' approach that Ofcom had adopted. For this reason, it was not appropriate for these migration costs to be allocated to the WLR rental product for the purposes of a LRIC calculation, and indeed, BT had not sought to include such migration costs in the WLR cost stack.

CPW's Reply

2.308 Mr Heaney contended[365] that migration costs should be included in WLR costs, and Ofcom had erred by excluding them. Ofcom indicated[366] that it had excluded migration costs because of the assumed use of legacy technology since, in the case where legacy technology was used, Ofcom argued that there would be no migration costs.

2.309 Mr Heaney suggested[367] that Ofcom seemed to agree that migration costs should be included in the case where new technology was assumed (and the transition to it would result in migration costs). However, Mr Heaney noted[368] that Ofcom seemed to contradict that acceptance of the need to account for migration costs if using an MEA approach since it also said that, rather than basing costs on new technology costs and migration costs, costs should be based on legacy costs and the hope that reduced ongoing costs would be enough to cover migration costs when they occurred. Mr Heaney did not believe that this was the correct approach, and LRIC costs should be based on the most efficient technology including all the relevant costs of providing services using that technology (eg migration costs).

2.310 Dr Houpis argued[369] that Ofcom did not address the fundamental argument that migration costs were clearly required and were efficiently incurred and were incremental to WLR, for example, in the case of an external WLR customer who did not use BT's broadband service. As the objective was to set the appropriate cost (and price) differential between WLR and MPF (and between WLR+SMPF and MPF),

[362]Ofcom WLR Defence, Annex, §71.
[363]Ofcom WLR Defence, Annex, §72.
[364]BT W/S Dolling III, §47.
[365]CPW W/S Heaney VII, §58.
[366]Ofcom WLR Defence, Annex, §70.
[367]CPW W/S Heaney VII, §59.
[368]CPW W/S Heaney VII, §60.
[369]CPW W/S Houpis VI, §56.

decisions made by BT as to the appropriate recovery of these costs were not relevant.

2.311 CPW argued[370] that the reason to migrate to NGN was that the current equipment was reaching the end of its life and that NGN was the most efficient technology for serving the current mix of demand in the future. The cost of migration was simply a cost of the normal replacement cycle which would be incurred whether or not the replacement assets provided new functionality.

Wiring, frame costs and tie cables

CPW's Appeal

2.312 CPW claimed[371] that Ofcom's treatment of wiring, frame costs and tie cables was erroneous and/or inappropriate.

2.313 Dr Houpis claimed[372] that Ofcom used the unit cost based on BT's cost CCA FAC forecast to estimate the LRIC of these elements. However, because of the historical legacy of BT's TDM network and BT's lack of incentives to reduce the costs for MPF lines, as BT's use of MPF was expected to be limited, this resulted in cost differences that were overstated with respect to the efficient forward-looking costs of providing MPF and WLR and which did not encourage productive efficiency, either in the provision of the components or in the wider provision of voice services.

2.314 CPW also claimed[373] that BT was planning substantially to redesign exchange building wiring and frames leading to a reduction in the additional costs currently required on MPF lines and these costs were expected to be fully recovered under Ofcom's proposal,[374] along with a proportion of fixed and common costs. CPW argued that BT therefore had no incentive to reduce the additional wiring required to serve MPF except in the case where this allowed BT to reduce its own costs. By contrast, as MPF was being used increasingly by BT's downstream rivals, BT had an incentive to incur an inefficient level of such costs to weaken competition.

2.315 CPW argued[375] that in order to ensure productive efficiency, a forward-looking LRIC estimate for these costs for MPF and WLR, respectively, should be based on efficient forward-looking costs similar to that previously proposed under the 21CN program. Under this scenario, the wiring required for provision of services through WLR or for MPF would be essentially similar and hence the LRIC cost included would also be similar.

Wiring approach

CPW's Appeal

2.316 CPW believed that the efficiently-incurred cost in this case was the use of the 'single jumper' approach. Mr Heaney estimated[376] that under the single jumper approach the cost of MPF was at least £5 less than using the current jumpering approach.

---

[370] CPW letter to the CC, 25 May 2010, Comments on CPW transcript.
[371] CPW WLR NoA, §105.5.
[372] CPW W/S Houpis III, §69.
[373] CPW W/S Houpis III, §70.
[374] CPW W/S Houpis III, §71.
[375] CPW W/S Houpis III, §71.
[376] CPW W/S Heaney III, §16.

2.317 Given that operators using MPF would compete with other operators using WLR (or WLR+SMPF), Mr Heaney argued[377] that it was necessary that the costs of MPF and WLR were consistent and there was a level playing field and the best way to achieve this would be to use a 'single jumper' approach.

Ofcom's Defence

2.318 In response to Mr Heaney's suggestion[378] that Openreach had an incentive not to pursue a single jumpering approach when BT was planning to use MPF, Ofcom[379] believed that there were other reasons why Openreach considered a single jumpering approach in order to support significant use of MPF by BT. For example, in many exchanges there was not enough space on the MDF to support a significant increase in MPF volumes. There would also be additional cost in some exchanges to find space for the intermediate frame. Given the complexity of the change and the uncertainty that it offered sufficient cost advantages, Ofcom did not consider it appropriate to assume that single jumpering was the appropriate basis for costing MPF.

2.319 Ofcom indicated that in any assessment about the cost of a new technology, assumptions would be required in relation to the design of the new arrangement as well as future demand, which might cause doubt over the actual future costs. However, Ofcom emphasized[380] that even if a lower-cost arrangement was available, 'the idea that we would set a lower charge for the current more expensive arrangement could potentially undermine people's incentives to want to move to a lower cost technology'.

BT's Intervention

2.320 In relation to CPW's argument for assuming single jumpering, Mr Dolling argued[381] that it was uncertain whether a single jumper approach to wiring for MPF would actually result in a lower overall cost for CPs consuming MPF, because there were a number of other costs that CPs would need to incur if they chose to move to a single jumper approach.

2.321 Mr Dolling noted[382] that some exchanges had been upgraded to 21CN and therefore had the capacity to use single jumpering, meaning that in theory all CPs could have configured their co-mingling installations in 21CN and EvoTAM-enabled exchanges in such a way to achieve single jumper MPF. Mr Dolling noted that there were 850 exchanges that had been upgraded for 21CN technology and to date, no CPs had converted to the single jumper MPF approach.

2.322 Mr Dolling argued[383] that it was difficult to assert that the introduction of a single jumper MPF wiring configuration would result in a more efficient process than the existing current wiring approach, given that the product did not exist (and costs would be incurred to develop it) and that other counterbalancing costs would also need to be taken into account.

---

[377] CPW W/S Heaney III, §20.
[378] CPW Heaney W/S III, §19.
[379] Ofcom WLR Defence, Annex, §85.
[380] Ofcom hearing transcript, 6 May, line 11, p75, to line 8, p76.
[381] BT W/S Dolling III, §§9–11.
[382] BT W/S Dolling III, §13.
[383] BT W/S Dolling III, §22.

2.323 Mr Dolling said[384] that a single jumper configuration required CPs to invest in a 21CN LLU tie cable (with connector plugs) to connect to the EvoTAM. Due to low tie pair utilization, Mr Dolling said[385] that a CP would have to buy more 21CN tie cables and the EvoTAM would need to have a higher port capacity, both increasing costs.

2.324 In addition, Mr Dolling argued[386] that a further cost would be the inefficient use of exchange space, which was a finite resource.

2.325 In response to Mr Heaney's statement that the single jumper approach for MPF was designed by Openreach for use by BT in the deployment of BT's NGN, Mr Dolling argued[387] that single jumper wiring was a design option for downstream BT consumption of MPF, although ultimately this was not pursued as the continuation of the existing voice and broadband wiring approach was seen as the more favourable design. The EvoTAM and associated 21CN LLU tie cables would have been dimensioned based on downstream BT installed base for voice and broadband services, thereby achieving a high utilization of 21CN tie cables and the EvoTAM, at least for the time being.

2.326 Mr Dolling noted[388] that the single jumper option applied only to BT exchanges that had been updated to 21CN technology. In these circumstances, Openreach had been able to reconfigure test access matrices (TAMs) so that CPs could connect directly to the TAM via tie cables, reducing the number of jumpers on the frame. However, in order to achieve this, CPs were required to invest in additional tie cables. To date, no CP had made this decision to invest and therefore no MPF lines were 'single line jumpered'. As such, Mr Dolling argued that it was not appropriate to adjust Openreach's costs to take account of a new solution that was not available on all exchanges and was not being taken up by CPs.

CPW's Reply V (29 March)

2.327 In response to Mr Dolling's argument that the 'single jumper' approach should not be reflected in Openreach's costs because it was not available at all exchanges and it was not being taken up by CPs, Mr Heaney argued that despite this, there was a more efficient way of providing jumpering for MPF which was cheaper, and this saving would more than offset the fact that the new approach involved a more expensive '21CN external tie cable' to be purchased by the CP. Mr Heaney argued that the reason why no CP had yet migrated to using the more expensive 21CN tie cables was that BT currently offered only a single MPF product, which it charged at a price based on the old jumpering approach. There was, therefore, no benefit for a CP in purchasing a more expensive 21CN tie cable, because the CP then had the worst of both worlds—the more expensive charge from Openreach and the more expensive 21CN tie cable. Mr Heaney argued that in a competitive market, a competing provider would be expected to provide the cheaper alternative, undercutting the price of the old technology by more than the additional cost of the 21CN tie cable.

2.328 Mr Heaney also noted[389] that Openreach was planning a roll-out of EvoTAMs which were necessary only for single jumpering, suggesting that the EvoTAM roll-out indicated that Openreach was planning a transition to single jumpering and so

[384] BT W/S Dolling III, §18.
[385] BT W/S Dolling III, §21.
[386] BT W/S Dolling III, §24.
[387] BT W/S Dolling III, §§27 & 28.
[388] BT W/S Dolling I, §94(b).
[389] CPW W/S Heaney IV, §117.

reinforced the view that Openreach's costs should be based on the use of single jumpering.

2.329 CPW noted[390] that BT itself was planning to use single jumpering in its 21CN deployment, and the option to use single jumpering was currently available in 850 exchanges.

2.330 In relation to Ofcom's argument that single jumpering would not result in lower cost because it would lead to lower utilization (and so higher costs) of evoTAMs, Mr Heaney argued[391] that the added cost resulting from lower evoTAM utilization was likely to be far less than the saving in frame and tie cable cost. Mr Heaney indicated that the net saving from frame and tie cable was about £6 a year, yet the cost from lower evoTAM utilization would probably be about 10p if efficiently managed, which CPW believed it could be.

2.331 Mr Heaney believed[392] that the fact that BT itself was planning to use single jumpering was prima facie evidence that single jumpering was in fact the most efficient wiring approach for MPF.

2.332 While BT argued that no LLU operator was currently using single jumpering for MPF, Mr Heaney[393] suggested that this provided no evidence against the conclusion that single jumpering was the most efficient approach. Mr Heaney suggested[394] that the reason why no LLU operator was using single jumpering today was because it would have to pay the cost of the more expensive tie cable, but would receive none of the cost saving from lower frames and tie cable cost.

2.333 While Mr Heaney agreed[395] that it would be necessary for a new product to be developed to allow the use of single jumpering, this should not be seen as an excuse for BT not to act efficiently.

2.334 With regard to BT's incentives for single jumpering, Mr Heaney believed[396] that under Ofcom's approach, because BT itself did not use MPF, BT had no incentive to act efficiently and introduce single jumpering for MPF lines. If BT were to carry on acting inefficiently and keeping MPF lines on the current jumpering approach, Mr Heaney suggested that it would be profitable for BT:

(a) by pursuing this inefficient approach, and being permitted by Ofcom to recover these inefficient costs, to fully recover its inefficient costs from MPF customers (ie it was profit neutral); and

(b) by acting inefficiently, to 'saddle' its competitors with added costs that BT itself did not incur, thereby weakening competition and so increasing its profits.

Ofcom's bilateral hearing (6 May)

2.335 With regard to Ofcom's objections to basing LRIC estimates on single jumpering, Ofcom said:[397]

[390] BT W/S Dolling III, §13.
[391] CPW W/S Heaney VII, §§39 & 40.
[392] CPW W/S Heaney VII, §44.
[393] CPW W/S Heaney VII, §46.
[394] CPW W/S Heaney VII, §47.
[395] CPW W/S Heaney VII, §50.
[396] CPW W/S Heaney VII, §51.
[397] Ofcom bilateral hearing transcript, 6 May, p75, lines 11–25.

> I guess the most obvious one is that single jumpering does not exist, so setting the price on the basis that it did would seem like a rather strange thing to do. It is quickly worth saying what the logic sequence here is. Carphone is sort of saying, 'There is this alternative jumpering arrangement which would be cheaper and because it is cheaper you should set the basis for the current service I use which does not use this arrangement at this lower level' and I guess our response would be firstly it is not clear to us that there is a cheaper arrangement because we can see pros and cons, but in order to actually work out whether it is cheaper or not you would have to design it, work out the demand for it and so on because you can change a lot of things.

BT's bilateral hearing, 16 May 2010

2.336 At its bilateral hearing, BT, summarizing, said:[398]

> One of the things that strikes us is that in the normal course of events you'd expect a CP who believes there is a more efficient means of delivering a service to place what's known as a statement of requirement to us … Normally also what would happen where this is an option is that a number if CPs consider it a more efficient way of doing things, it would end up becoming an industry SoR … there has been no statement of requirement, whether from the CP or Carphone Warehouse for single line jumpering. The reasons really behind the lack of economic reasoning behind single line jumpering being cheaper technology is single line jumpering in the circumstances we have with MPF would require that the test access matrix, the TAM, is over-specified, because of the technology that is used. Each other lines that a CP would install for its MSAN would have to be directly wired into the TAM, so therefore the TAM would have to be specified where the demand was, rather than the demand being managed by some flexibility point. That would obviously increase the cost of single line jumpering. The CP tie cables that they use to tie into the Tam would be underutilized, and there'd be the cost of the product development, product management and of course, if we wanted to add a flexibility that would allow the efficient development of the TAM, rather than one that was over-specified, we'd have to add an extra flexibility point which Ofcom mention in their defence of the intermediate frame—which again, would be an extra cost. So no means has it been decided, approved, assessed, that single line jumpering is the lower cost and commercially efficient MEA. So that's why we disagree with Carphone.

BT's letter of 19 May 2010

2.337 In response to Mr Heaney's statements at the CPW WLR bilateral hearing,[399] BT said[400] that if any other CP disagreed, then the normal course of action would be for it to submit a formal Statement of Requirements for Openreach to undertake a formal evaluation. BT noted that, to date, no CP had done so and it considered that that lent support to its position that the case that 'single jumpering is more efficient' was not proven.

[398] BT bilateral hearing, 12 May.
[399] CPW hearing, 30 April, lines 22–32, p100.
[400] BT letter to the CC, 19 May 2010, Comments on CPW transcript.

Internal tie cable costs

CPW's Appeal

2.338 Internal tie cables costs are incurred by Openreach to provide certain services.[401] For instance, under the current jumpering arrangement, two internal tie cables are used in producing MPF though under a single jumper approach no tie cables are required for MPF. One tie cable is used for WLR. No tie cables are used for SMPF.

2.339 Mr Heaney argued[402] that the tie cable used for WLR should be based on MEA technology, which he believed was an NGN. Where an NGN was used, a more expensive tie cable was required (with an inline or evoTAM). In the case of the difference between MPF and WLR+SMPF, there were no additional tie cables used for SMPF. Therefore, the LRIC cost difference was the same, ie £3.00.[403]

Ofcom's Defence

2.340 Ofcom[404] argued that even with the single jumpering approach, only a relatively cheap tie cable should be assumed, on the grounds that the existing TDM technology should act as a cap on the WLR charge control.

BT's Intervention

2.341 Mr Dolling argued[405] that the costs associated with investment into tie cables were actually included in the line-card component and so there was no additional differential for tie cables.

Frame costs

Ofcom's Decision

2.342 In the WLR Statement, Ofcom decided[406] that MPF and WLR should be allocated different frame costs, pointing to evidence in the regulatory accounts which suggested that MPF had more frame costs than WLR. Ofcom said that this result was because MPF currently involved more jumpering on the exchange than WLR.

2.343 While CPW argued that in the future a different option for jumpering for MPF would be used that would result in MPF using the main distribution frame to the same extent as WLR, Ofcom noted[407] that no MPF lines were currently jumpered in this way, and no evidence to suggest that this was how most MPF lines would be connected in future networks was provided.

CPW's Appeal

2.344 Mr Heaney argued[408] that the number of jumpers used by MPF and WLR under an efficient single jumper approach were the same—a single jumper was used in both

[401] CPW W/S Heaney III, §28.
[402] CPW W/S Heaney III, §29.
[403] CPW W/S Heaney III, §30.
[404] Ofcom WLR Defence, Annex, §§88 & 89.
[405] BT W/S Dolling I, §94(c).
[406] WLR Statement, §§5.53–5.57.
[407] WLR Statement, §5.60.
[408] CPW W/S Heaney III, §25.

cases, and therefore there was no cost difference as between MPF and WLR. In the case of WLR+SMPF, additional jumpers were required for SMPF. Mr Heaney also argued[409] that Ofcom should have relied on the 2007/08 regulatory accounts, and suggested that there was a discrepancy between the 2008/09 RFS numbers and Ofcom's modelling.

Ofcom's Defence

2.345 In response, Ofcom argued[410] that the CCA FAC figures in its model were derived by a more reasonable allocation method than the RFS, as the model was based on an allocation of frame costs by usage of that frame.

BT's letter of 28 May 2010

2.346 Under the case that single jumpering represented the MEA, BT suggested[411] that due to a mistake in the RFS, Mr Heaney used incorrect cost data to calculate the frame cost differential.

CPW's letter of 28 May 2010

2.347 While CPW accepted[412] that Mr Heaney had relied on incorrect data to calculate frame costs, CPW suggested that the existence of such material errors in the final model, and BT's and Ofcom's inability to identify and correct them, reinforced CPW's contention that the models were not properly scrutinized.

Product management

Ofcom's Decision

2.348 In the WLR Statement, Ofcom decided[413] that WLR did not involve higher product management, servicing and fault repair costs than MPF. In summary, Ofcom believed that WLR was an established product with users who had fairly homogenous demands, leading to comparatively low product development and management costs. In contrast, MPF users tended to have diverse requirements, and accommodating these tended to increase product development and management costs.

CPW's Appeal

2.349 CPW believed[414] that Ofcom's analysis of product management, serving and repair costs was erroneous and/or inappropriate.

2.350 Mr Heaney[415] gave several reasons why product management costs would be higher for WLR than MPF, including that the basic WLR product had a number of features or services such as call barring and caller ID which were not required for MPF, which would incur some cost to product manage; that WLR included added functionality and more service levels (eg time to repair faults) when compared with MPF; and that

---

[409] CPW W/S Heaney III, §27.
[410] Ofcom WLR Defence, Annex, §87.
[411] BT letter to the CC, 28 May 2010, Frame Costs.
[412] CPW's letter to the CC, 28 May 2010, Comments on Frame Costs.
[413] WLR Statement, §5.73.
[414] CPW WLR NoA, §105.6.
[415] CPW W/S Heaney III, §36.

the customer base for WLR was highly fragmented, with hundreds of customers. Conversely, for MPF the customer base was highly concentrated, with three customers probably accounting for over 99 per cent of volume. This should result in lower sales/account management costs.

2.351 Mr Heaney also argued[416] that the fault rate on MPF should be no more than WLR. For the assessment of the LRIC cost difference between MPF and WLR (ie when the line was being used for voice only), Mr Heaney considered that any additional faults on MPF related to broadband were not relevant—since WLR included more elements (ie line card), then one would expect the number of faults to be higher on WLR. Mr Heaney suggested that a source of Ofcom's error may have been that it was using out-of-date data from 2007/08.

Ofcom's Defence

2.352 CPW's argument assumed a scenario where MPF voice-only services were provided. Ofcom[417] rejected this scenario, and considered the MPF charge on the basis on which it was currently used, which was to provide voice and broadband services.

2.353 Ofcom[418] argued that although WLR had some specific product management costs, it was also the case that there were some MPF-specific product management costs and therefore there was no clear rationale why WLR management costs should be substantially higher than MPF.

2.354 Ofcom[419] considered that development costs for WLR could not be materially higher than for MPF. This was because the MPF product was used to support a wide, and increasing, range of retail services and accordingly there were high demands on the MPF product. In contrast, the WLR product only supported retail voice services and was a fairly well-established product.

2.355 Ofcom's[420] analysis concluded that the CCA FAC figures for product management in aggregate (including both sales and development) were almost the same for MPF and WLR.

2.356 With regard to fault rates, CPW appeared to accept that higher faults were expected on a copper line that was used for broadband than one that was used only for voice since the broadband service was more susceptible to, and less tolerant of, faults.[421] However, Ofcom[422] disagreed with CPW's assumption that as a basis for setting charges it would be necessary that a voice-only MPF product was actually supplied, arguing that this would mean that Openreach would have to supply two separate and distinct MPF products, one for voice-only use, charged for on the basis of a voice-only fault rate, and another for broadband + voice use, charged for on the basis of a higher fault rate. Ofcom noted that this might be infeasible, was probably undesirable and was not the basis on which MPF was currently sold.

2.357 Ofcom[423] considered that using the latest historical fault rate ratio in the forecasts for 2012/13 was the appropriate basis for estimating fault rates, as opposed to using a

[416]CPW W/S Heaney III §42.
[417]Ofcom WLR Defence, Annex, §90.
[418]Ofcom WLR Defence, Annex, §92.
[419]Ofcom WLR Defence, Annex, §94.
[420]Ofcom WLR Defence, Annex, §95.
[421]CPW W/S Heaney III, fn 24.
[422]Ofcom WLR Defence, Annex, §97.
[423]Ofcom WLR Defence, Annex, §98.

forecast of how fault rates might differ between MPF and WLR in 2012/13 as suggested by CPW.

2.358 Ofcom[424] did not accept that there was an adequate basis for Mr Heaney's assertion[425] that there would be a significant reduction in the difference in care levels between MPF and WLR as a result of the service harmonization programme.

2.359 With regard to service standards, Ofcom[426] argued that the current CCA FAC numbers did not capture the current difference in SLAs, and therefore they would not overstate the difference if the difference between SLAs changed. Rather, the current CCA FAC numbers did not fully capture the difference in SLAs and so tended to understate the additional fault repair costs associated with MPF compared with WLR. They would continue to do this, even if the difference between the service standards narrowed.

BT's Intervention

2.360 BT regarded[427] Ofcom's approach to the issue of the cost differential as robust and appropriate, having regard to a number of economic and practical considerations.

2.361 Mr Dolling agreed[428] with Ofcom that the appropriate scenario to consider was where MPF was being used to provide voice-only services because MPF was not in practice used for voice-only services.

2.362 Mr Dolling argued[429] that there were at least two flaws in Mr Heaney's argument that there was more pricing innovation in relation to WLR. The first was that he was using an ancillary product (WLR connection), with its own pricing and cost stack, as an example of pricing innovation compared with a completely separate rental product (MPF rental). The second was that the CRS prices were all subject to and determined by the price controls being appealed by CPW in this process, which meant that prices would rise/fall in given years according to the RPI+/–X per cent per the price control and not any direct pricing innovation by BT.

2.363 Mr Dolling disagreed[430] with Mr Heaney's argument that the fragmented customer base of WLR compared with the relatively concentrated MPF base should result in lower sales/account management costs for MPF, with a greater share of sales and product management costs flowing to WLR. Mr Dolling said that account management of customers by Openreach's sales personnel was determined by a combination of the revenue earned, the revenue potential and the complexity of the products provided. Multiple smaller (fragmented) CP customers of WLR were managed by single sales account directors, whereas single large MPF customers were managed by dedicated account directors.

2.364 Mr Dolling agreed[431] with Ofcom's description of the differences between MPF lines and WLR/WLR+SMPF, and regarded MPF as having similar or higher costs than WLR but less than WLR+SMPF.

[424]Ofcom WLR Defence, Annex, §§99 & 100.
[425]W/S Heaney III, §§44 & 45.
[426]Ofcom WLR Defence, Annex, §§101 & 102.
[427]BT WLR SoI, §25.
[428]BT W/S Dolling III, §33.
[429]BT W/S Dolling III, §§37 & 38.
[430]BT W/S Dolling III, §39.
[431]BT W/S Dolling I, §94(g).

CPW's Reply

2.365 Based on Mr Heaney's estimate of the product management cost per line, CPW argued: [432]

(a) The cost of product management on SMPF seemed implausibly low. For example, there was no reason to believe that the product management cost per SMPF line was just one-fifth that of MPF.

(b) The assumption that WLR only required 25 per cent more product management cost per line than MPF seemed implausible given that there were a number of cogent reasons to expect the product management cost of WLR to be higher than MPF, for example WLR had more additional features and functionality than MPF.

(c) Ofcom's comment that MPF would have a higher cost since it supported more retail services was misplaced because the extra capabilities provided in retail products were not an inherent part of the MPF product but were features added by LLU operators.

(d) WLR was provided to smaller customers who were proportionately more expensive to manage.

CPW's bilateral hearing 30 April

2.366 With respect to product management, CPW acknowledged[433] at its bilateral that 'in the scheme of things product management is relatively small. So although we don't think it should just be ignored, you know, in terms of the focus of effort it may be won't warrant as much effort as some of the other issues'.

BT's letter of 19 May 2010

2.367 In response to Mr Heaney's suggestion that WLR product management costs should be much higher than those for MPF because WLR included 'call features, includes voicemail and lots of other things, and numbering and number management', BT argued[434] that none of these cost categories was included in the WLR rental cost stack, and none of them was related to product management costs.

CPW's letter of 26 May 2010

2.368 CPW argued[435] that:

(a) The WLR cost per line (versus MPF) did not reflect adequately the impact that its additional features, functionality, complexity and fragmented customer base should have on its product management costs.

(b) The SMPF cost per line was far too low. It probably required as much product management as MPF, and certainly there was no reason to believe that it required only one-sixth of the product management that MPF did.

[432] CPW W/S Heaney VII, §66.
[433] CPW bilateral hearing transcript, 30 May, p106, lines 2–9.
[434] BT letter to the CC, 19 May 2010, Comments on CPW transcript.
[435] CPW letter to the CC, 26 May 2010, Comments on BT transcript.

2.369 While CPW accepted[436] that the magnitude of product management cost error was relatively small compared with other errors identified, as CPW previously argued, this did not mean that the error should not be corrected, as the cumulative impact of such errors may be great.

Accommodation and power cost

2.370 Mr Heaney claimed[437] that CPW's estimate of the line-card cost category (£16.50) included only the cost of the line card and MSAN and did not include accommodation and power. Adopting Ofcom's approach of including accommodation and power costs in the line-card category, then Mr Heaney's estimate for the line-card cost was £19.82 (= £16.50 + £3.32) as against Ofcom's estimate of £11–£13.

2.371 Ofcom[438] argued that Mr Heaney's assertion that the line-card cost excluded accommodation and power was incorrect, as he ultimately based CPW's estimate on a figure in Ofcom's Second Consultation,[439] which included accommodation and power.

2.372 Mr Dolling agreed[440] with Ofcom that accommodation/power costs were included in the line-card cost, and therefore there was no additional differential.

Depreciation

CPW Appeal

2.373 Dr Houpis stated[441] that the starting CCA-based unit costs of line cards was likely to be too low to allow an efficient operator to make a reasonable return, due to a high proportion of fully depreciated assets. CCA depreciation as implemented by BT resulted in capital charges for individual assets falling over the lifetime of the asset as capital employed fell, with the depreciation charge remaining constant. Assets which remained in service past the end of their assumed useful lives generated no capital charge, as the capital employed was zero and there was no depreciation charge.

2.374 Dr Houpis argued[442] that the forecast annualized capital charges for the line-card element of the WLR service, and for other cost elements, were based on BT's regulatory accounts which were based on straight-line depreciation. But for many assets, capital charges (depreciation plus an allowance for the cost of capital) calculated by this method were zero because these assets were reaching the end of their accounting lives, had not yet been replaced and had been written down to zero. Dr Houpis supported this by examining the trend in reported costs for PSTN line cards where the unit cost of a PSTN line card in BT's CCA regulatory accounts was reported to have fallen from £14.89 a year in 2004/05, to £9.48 a year in 2007/08.

2.375 CCA depreciation as implemented by BT resulted in capital charges for individual assets falling over the lifetime of the asset as capital employed fell, with the depreciation charge remaining constant. Assets which remained in service past the end of their assumed useful lives generated no capital charge, as the capital employed was zero and there was no depreciation charge.

---

[436] CPW letter to the CC, 26 May 2010, Comments on BT transcript.
[437] CPW W/S Heaney III, §§13 & 14.
[438] Ofcom WLR Defence, Annex, §§103 & 104.
[439] CPW W/S Heaney, §14, and CPW W/S Heaney I, §258.
[440] BT W/S Dolling I, §94(d).
[441] CPW W/S Houpis I §50.
[442] CPW W/S Houpis I §30.

Ofcom's Defence

2.376 In response to Dr Houpis's argument that Ofcom's figures were likely to under-estimate the appropriate depreciation for line cards, as he argued they were already heavily depreciated, Ofcom noted[443] that PSTN line cards were depreciated over a ten-year life, and in 2007/08, PSTN depreciation and return on capital employed formed less than half of aggregate line-card costs. 21CN line cards and other operating costs (including maintenance) presented the biggest cost heading.

[443]Ofcom Defence, Annex §67.

Section 3: Analysis

Part 1: Reference Question 1

3.1 This part sets out our conclusions as to whether Ofcom erred in setting the level of WLR price controls as claimed by CPW in §§76–107 of the WLR NoA.

3.2 For the reasons given below in paragraphs 3.37 to 3.51, 3.55 to 3.65, 3.75 to 3.84, 3.96 to 3.110, 3.120 to 3.127, 3.137 to 3.139, 3.151 to 3.158 and 3.161 to 3.162, our determination is that Ofcom has not erred in setting the level of WLR price controls as claimed by CPW in §§76–107 of the WLR NoA.

Reference Question to answer

3.3 Reference Question 1 asks:

> Whether, for reasons set out within paragraphs 76 to 107 of the Notice of Appeal, the WLR Price Controls have been set at a level which is inappropriate because OFCOM failed to set the controls in such a way as to secure that the differential between, on the one hand, the price for WLR and/or WLR + SMPF and, on the other hand, MPF was at least equivalent to the long run incremental cost ("LRIC") difference between those services:
>
> (i) by reason of OFCOM setting the price differentials on a current cost accounting and fully allocated costs basis rather than on a LRIC basis, as explained, in particular in paragraphs 87 and 88 of the Notice of Appeal; or
>
> (ii) by reason of OFCOM having erred in its calculation of LRIC for the reasons set out in paragraphs 92 to 105 of the Notice of Appeal.

3.4 §§76–107 of the NoA concern Ofcom's approach to setting the level of the WLR price controls. §§87 and 88 of the NoA specifically concern Ofcom's approach of setting the price differentials on the basis of a CCA and FAC basis rather than on a LRIC basis. §§92–105 of the NoA specifically concern Ofcom's approach to determining the LRIC differential.

Structure of the determination of Reference Question 1

3.5 Reference Question 1 raises two issues:

(a) whether, because Ofcom set the prices on a CCA FAC basis rather than on an LRIC basis, it failed to set the WLR price control in such a way as to secure differences between:

- the price of the combination of WLR and SMPF,[1] and the price of MPF;[2] and
- the price of WLR and the price of MPF[3]

[1] We abbreviate 'the combination of WLR and SMPF' to 'WLR+SMPF' for the rest of this document.
[2] We abbreviate 'the comparison of the price of the combination of WLR and SMPF, and the price of MPF' to 'WLR+SMPF vs MPF' for the rest of this document.
[3] We abbreviate 'the comparison of the price of WLR, and the price of MPF' to 'WLR vs MPF' for the rest of this document.

that were at least equivalent to the difference in the LRICs of these services; and

(b) whether Ofcom erred in its calculation of LRIC as a means of cross-checking its CCA FAC approach.

3.6 In the WLR NoA, CPW argued that the WLR+SMPF vs MPF and WLR vs MPF price differential must not be less than the LRIC cost differential.[4] CPW also argued that for reasons of both productive and allocative efficiency the WLR+SMPF vs MPF and WLR vs MPF price differentials should both be larger than the differences in their LRICs.[5]

3.7 Ofcom used CCA FAC as its basis of calculating the charges in both the LLU and WLR price controls. However, its methodology also involved what it termed a 'cross-check' to its estimates of LRICs. Ofcom found that the difference between the charges for WLR and MPF for 2012/13 was in line with the estimated range[6] of the LRIC differences and that the difference between charges in 2012/13 for MPF vs WLR+SMPF was larger than the estimated LRIC difference.[7]

3.8 CPW did not accept this because it considered that Ofcom had miscalculated the LRIC differentials.[8]

3.9 In our view, the appropriateness of Ofcom's CCA FAC basis is largely determined by the reliability of its estimates of the LRICs required for the cross-check approach. We therefore examine that issue first, addressing part (ii) of the Reference Question before part (i).

Has Ofcom erred in its calculation of the LRIC differentials?

Introduction

3.10 CPW said that the appropriate cost standard for determining the structure of charges was the efficient forward-looking LRIC and that, in this case, the efficient network to operate in the long run was an NGN even if BT might in the short run decide to continue to operate its legacy network. CPW said that Ofcom's LRIC estimates were therefore incorrect because:

- line-card costs should be based on WLR being allocated the full cost of an NGN line card;
- migration costs, the cost of disconnecting WLR lines from BT's current network and connecting them to an NGN network, should be included in WLR costs;
- cost differences should be based on the use of single jumpering and tie cable costs should be based on the costs of a particular type of tie cable;[9] and
- Ofcom's assumptions as to fault repair and product management cost differences between WLR and MPF were incorrect.[10]

---

[4]WLR NoA, §78.1.
[5]WLR NoA, §78.2. This is discussed further in the answer to Reference Question 2.
[6]These figures were prepared as ranges rather than point estimates.
[7]WLR Statement, §§5.86–5.91.
[8]CPW W/S Heaney VII, §26.
[9]CPW said that the use of 21CN-100 pair enhanced internal Tie Cable-HDF should be assumed—see paragraph 122.
[10]CPW letter to the CC dated 12 May 2010.

3.11 CPW said that Ofcom's approach of setting WLR charges on the basis of legacy costs could be expected to result in WLR being priced at less than the appropriate forward-looking cost and, potentially, charges for usage rising above the appropriate forward-looking cost in order to enable cost recovery. This could be expected to have a number of detrimental effects on economic efficiency:[11]

- Costs would be recovered in a way that implied that the price of certain services would be set below efficient cost, and others would be set above efficient cost, leading to allocative inefficiency.

- Investment in NGN could be unnecessarily delayed, leading to a loss of potential productive efficiencies, as the NGN technology was expected to result in lower costs.

- Competitors (including mobile network operators), which could offer voice services to voice-only customers, potentially more efficiently than BT, could be discouraged or prevented from doing so, even though it might have been efficient for them to do so.

3.12 CPW also said that Ofcom had erred in its LRIC estimates as it had excluded the cost of assets whose lifetime had exceeded expectations.[12] More generally, it said that Ofcom had based its projections on the current level of costs reported by BT, which might not be a good basis for estimating forward-looking costs.[13] CPW said that Ofcom had provided no information as to how it estimated the adjustment made to line-card costs in order to allow for fully depreciated assets.[14,15] In addition, CPW noted that the existing tie cables were largely depreciated in the CCA accounts.[16]

Frontier Economics analysis

3.13 On 27 April 2010, CPW sent us a report prepared by Frontier. CPW had prepared various quantitative estimates of the errors it claimed Ofcom had made and this report provided CPW's final and best estimates.[17] We reproduce some of the figures here to provide an illustration as to the size of CPW's claim.

3.14 Table 3.1 below shows Ofcom's and Frontier's estimates of the LRIC differentials for MPF vs WLR, and MPF vs WLR+SMPF. The table shows that including the full costs of a combi-card and migration cost[18] accounts for a large proportion of CPW's estimates of the LRIC differential. The top part of the table shows Ofcom's and Frontier's estimates of the LRIC differentials for MPF vs WLR and MPF vs WLR+SMPF and the difference between these numbers. In relation to MPF vs WLR+SMPF, CPW estimated the LRIC differential to be £30.68 rather than the £17.50 estimated by Ofcom. The lower part of the table provides a breakdown of Frontier's estimates of the LRIC differentials. It shows the effect of each adjustment Frontier made on the LRIC differential. CPW also raised issues of line-card depreciation and product management which were not reflected in the Frontier figures.

---

[11] CPW W/S Houpis III, §28.
[12] CPW LLU NoA, §96b.
[13] CPW W/S Heaney I, §224b.
[14] CPW W/S Houpis III, §§48 & 49.
[15] These arguments on the treatment of line-card costs are only relevant if we do not accept CPW's arguments on the appropriate cost base.
[16] CPW LLU NoA, §96b.
[17] CPW WLR bilateral hearing transcript, p14, line 9.
[18] CPW W/S WS Heaney I, §234.

TABLE 3.1 **CPW's claim: MPF vs WLR residential and MPF vs WLR residential +SMPF differentials (2012/13)**

	£ in 2012/13	
	WLR vs MPF LRIC	*WLR+SMPF vs MPF LRIC*
Total Ofcom*	10.00	17.50
Total CPW/Frontier†	23.35	30.68
Difference in approach	13.35	13.18
Constituent differences:		
Line card‡	[✄]	[✄]
Migration	[✄]	[✄]
Fault rate adjustment§	[✄]	[✄]
Test equipment equalize¶	[✄]	[✄]
Transfer charges#	[✄]	[✄]
Single jumpering	[✄]	[✄]
Total (of these)~	[✄]	[✄]

Source: CC analysis of Frontier model.

*This is the mid-point of Ofcom's estimates of the differential. Ofcom's WLR Statement §§ 5.86 and 5.87.
†CPW letter 1 June 2010 Annex table 1.
‡The difference between CPW's LRIC estimate of £16.50 and the mid-point of Ofcom's estimated range for the LRIC of £11 to £13.
§This estimates the effect of not correcting the error that Frontier said it had found in Ofcom's data input. Thus the fault rate assumptions that Ofcom used are put into the model rather than the values that Frontier stated Ofcom intended to use. See page 21 of the Frontier model report.
¶This reverses the Frontier assumption that test equipment cost of capital should be allocated equally to the services to match the Ofcom test equipment depreciation assumption (Frontier report, p28).
#The LRIC effect here may be created by directories. To show the effect of the LRIC assumption the Frontier LRIC assumption is compared to the LRIC figure for directories in Heaney WS 1 (i.e. 0.5).
~ Several of the cost elements have a lower LRIC in the Frontier model than in Ofcom's analysis so this number overestimates the total LRIC by not including these negative values. However, the negative values are removed in the cost category by cost category mark-up which equates the increment for those costs to the Ofcom FAC numbers.

3.15 The Frontier numbers show the effect of the use of NGN by including in the WLR costs the cost of a combi-card and the costs of migrating WLR lines from one access network to another and the single jumpering wiring approach. Frontier made adjustments it considered necessary to ensure that the assumptions that Ofcom said it had made on fault rates were implemented correctly[19] and the mean capital employed allocation for test equipment to be equal for each service to match the depreciation allocation.[20] In addition, the full fixed costs of directories were allocated to WLR.[21,22]

Assessment

3.16 We do not consider that Ofcom erred in the calculation of the LRIC differentials as a cross check of its CCA FAC approach. We consider that each of CPW's claims, in respect of how Ofcom incorrectly calculated LRIC, was unfounded. These claims were that:

- Ofcom failed to base its calculation of LRIC on the costs associated with NGN technology;

[19]Frontier report, p21.
[20]Frontier report, p28.
[21]Frontier report, p25 and footnote 7. CPW W/S WS Heaney I, Figure 18.
[22]CPW submitted the evidence produced by Frontier at a relatively late stage of the WLR Appeal. Whilst we have carefully considered this evidence, it has not been possible for us to scrutinize the calculations and assertions as rigorously as we would have done had such evidence been submitted to us earlier on in the WLR Appeal. For example, we were not able to test the evidence in any of the bilateral hearings with the other parties in the WLR Appeal. Nevertheless, we have considered the evidence and used it in our assessment where we considered it appropriate to do so.

- Ofcom made an error in calculating LRIC by not assuming costs to be based on single jumpering;
- in calculating LRIC based on legacy costs, Ofcom failed to take adequate account of fully depreciated line cards and tie cables; and
- Ofcom failed to allocate the correct amount of product management and service costs to WLR compared with MPF.

We set out below our assessment of each of these claims.

(a) Did Ofcom err in failing to calculate the LRIC differentials based on NGN technology rather than legacy technology?

Introduction

3.17 CPW argued that the LRIC differential should be estimated based on the use of NGN technology. As set out above (paragraph 3.10), the effect of CPW's argument would be to include in the WLR costs the full cost of a combi-card and migration costs. According to Frontier's calculations, this would increase the differential between the LRIC estimates for MPF and WLR+SMPF by £[✂] (£[✂] + £[✂]).

3.18 Ofcom said that its approach was to base the price controls on the costs of maintaining the legacy technology. It said that its approach had the advantage of promoting efficient choices by CPs between MPF and WLR and, more importantly, between MPF and WLR+SMPF, and it avoided undermining incentives for BT to invest in new technology.

3.19 Ofcom said that it was not entirely clear that NGN should be regarded as the efficient forward-looking technology. Ofcom said that this might be a wireless network or a fibre-to-cabinet network or a fibre-to-premises network.[23] Ofcom also argued that CPW had applied incorrectly the principles of an MEA evaluation of existing assets.[24]

3.20 We consider that these arguments raise two discrete issues: (i) whether Ofcom erred in its use of a legacy cost-based approach; and (ii) whether the efficient forward-looking costs for BT's access network would be NGN based. We consider each of these arguments in turn.

(i) Did Ofcom err in adopting a legacy cost approach

Introduction

3.21 Ofcom explained that what it referred to as a 'technology-neutral' approach meant that it would set charges based on the costs of continuing to provide existing services using the legacy technology until some new technology became established. Once a new technology had been established, charges could gradually be moved to reflect the new technology, in terms of both the level and structure of charges.[25] We refer to this approach as Ofcom's legacy cost approach, which distinguishes it from CPW's approach based on the costs of technology that should be expected to be employed

[23] Ofcom WLR bilateral hearing transcript, lines 31–36, p6.
[24] Ofcom WLR Defence, Annex, §26.
[25] Ofcom WLR Defence, Annex, §32.

going forward. We note that CPW considered Ofcom's 'technology-neutral' terminology to be potentially misleading.[26]

3.22 Ofcom considered that its legacy cost approach encouraged efficient investment in new technology by both BT and other CPs. In particular, Ofcom said that:

- if all relevant charges were set on the basis of the continued use of the existing or legacy technology, then companies would have an incentive to invest in the new technology only if it lowered costs compared with the old technology;[27]
- this approach would induce efficient choices by CPs between MPF and WLR or WLR+SMPF, and thereby minimize the total costs incurred by BT and other providers in providing access products;[28] and
- if prices were based on the costs of future technology there would be a danger that BT's actual investment plans would inform expectations of future costs. To base prices on these costs could distort BT's incentives to invest in new technology.[29,30]

3.23 Ofcom said that the incorrectness of CPW's approach was demonstrated by the fact that it would result in higher costs of providing voice-only services using WLR lines, reflecting largely the different cost structure of employing MSANs in the local exchange, at a time when these were not being used and so end-consumers were not enjoying the benefits that this technology might bring.[31]

3.24 CPW said that Ofcom erred because its legacy cost approach would distort incentives for BT and other CPs to invest in new technology in the access network.

3.25 Ofcom characterized CPW's approach as an incorrect application of an MEA-based methodology where it had correctly valued existing assets at replacement cost, but had incorrectly failed to adjust for additional functionality, capacity or other enhancements.

3.26 CPW said that it was not arguing for an approach based on existing assets valued on an MEA basis. Rather, CPW's argument was that an efficient BT would not be operating with legacy assets and that the forward-looking asset base would be NGN based.[32]

Assessment

3.27 We do not consider that Ofcom erred by adopting a legacy-cost-based approach to estimating the LRIC differentials. This is for two reasons:

- We do not consider that CPW demonstrated that Ofcom's legacy cost approach would distort incentives for BT and other CPs to invest in new technology in its access network.

[26] CPW Houpis W/S VI, §9(a) and 14
[27] Ofcom WLR Defence, Annex §33.
[28] Ofcom WLR bilateral hearing slide pack, slide 6.
[29] Ofcom and CPW referred to this problem as a 'feedback loop'.
[30] Ofcom WLR bilateral hearing transcript, p7, line 15 and onwards.
[31] Ofcom WLR bilateral hearing transcript, p47, lines 10–25
[32] CPW WLR bilateral hearing transcript, p34, line 20, to p35, line 7.

- We do not accept the points made by CPW in response to Ofcom's argument on the implications of CPW's approach for voice-only services.

3.28 Under each of these headings we summarize what we consider to be the key arguments made by the parties.

The incentives to investment in new technology created by Ofcom's approach

3.29 We do not accept CPW's argument that Ofcom's approach would distort incentives for BT or other CPs to invest in new technology in its access network.

3.30 Ofcom said that it was important to recognize that it had set all other regulated BT charges which might be affected by the possible change in technology on the same legacy cost basis. Ofcom gave the examples of recently-set controls for wholesale fixed-call origination and termination and leased lines. The significance of these examples was said to be that if a new technology was cheaper overall (even though the costs of some particular services might be increased), then both BT and other CPs would have an incentive to invest in it.

3.31 Ofcom characterized CPs' choices between MPF and WLR or, more likely, MPF and WLR+SMPF as being a decision about whether to use equipment owned and operated by BT or to invest in supplying, to themselves, certain equipment located in BT's exchanges.[33] Ofcom argued that its legacy cost approach, as well as providing efficient investment incentives to BT, would also send efficient price signals to other CPs as to whether to invest in MPF. In particular, if the relative costs of MPF vs WLR and/or WLR+SMPF reflected the costs to BT of providing these services, CPs would only invest in supplying equipment if they could do so more cheaply than BT.[34]

3.32 Ofcom said that CPW's approach, which resulted in higher charges for WLR and lower charges for MPF, could encourage CPs to invest in MPF technology even when the costs of doing so would be greater than the costs saved in the provision of WLR lines. The result would be higher overall costs for the provision of access services (see Section 3: Part 2, paragraph 3.242).

3.33 CPW said that, if the delivery of services by the use of a new technology could be expected with a reasonable degree of confidence to be cheaper than using existing technology, then setting the prices according to a regulator's best estimate of the future costs of the new, or a combination of old and new, technology should make no difference to the incentives of the regulated company to switch to using the more efficient technology, compared with setting prices according to the costs of the legacy technology. Therefore, Ofcom's proposal of setting prices on the basis of the legacy technology should not be expected to provide a stronger incentive for BT to move to the NGN technology, compared with an alternative of setting prices on the basis of the new technology, if the new technology was cheaper.[35] CPW said that Ofcom's approach had no more superior efficient investment promotion properties (or was no more 'technology neutral') than the approach proposed by CPW, as NGN was a sufficiently established technology with known and lower costs.[36]

[33] Ofcom WLR bilateral hearing, slide 6.
[34] Ofcom WLR Defence, Annex, §§35–38.
[35] CPW W/S Houpis VI, §17.
[36] CPW W/S Heaney VII, §24.

3.34 CPW also did not agree that Ofcom's approach provided efficient signals to investment. On this point, CPW made the following arguments:[37]

- Ofcom's approach could result in investment in NGN being inefficiently delayed if WLR prices were set below efficient MEA costs and BT could not recover the shortfall in WLR revenues from higher call charges for at least some voice-only customers.[38]

- Linking, as Ofcom had, the use of NGN costs for setting prices to BT's deployment of new technology would, if applied more generally beyond merely the structure of prices, create a disincentive for BT to invest in the new technology. This was because BT would expect that a faster move to the new technology would trigger Ofcom to set new, lower prices.

- Ofcom's approach, which underestimated BT's costs, would, if applied more generally beyond the structure of prices, provide incorrect signals to investment decisions.

3.35 In relation to the incentives for CPs to invest in new technology, CPW argued that, in contrast to Ofcom's approach, its proposal of using the efficient forward-looking technology to calculate the differential between the costs of MPF and WLR in 2012/13 minimized the risk of creating a distortion in the relative price of MPF and WLR+SMPF by setting a charge for WLR that was unduly low, through the use of a legacy technology.[39]

3.36 CPW said that Ofcom's approach of using legacy technology to estimate costs in order to promote productive and dynamic efficiency could only be valid if Ofcom's estimates of the costs of providing WLR when using the legacy technology were subject to greater certainty than the estimates of using NGN. CPW's view was that estimating the incremental cost of providing the WLR service using the legacy technology was inherently difficult, as there was no readily observable market information on the price of the related legacy equipment. Therefore, there was no reason to expect Ofcom's estimates of the costs of using legacy equipment to be more accurate estimates of the forward-looking incremental costs of delivering WLR using the legacy technology than the estimates it would obtain using NGN. In fact, CPW expected the reverse to be true.[40]

3.37 We do not agree with CPW that Ofcom's approach would not create efficient investment incentives. We have taken into account the following six reasons.

3.38 First, Ofcom said that it had set other regulated charges on the same legacy cost basis. We agree with Ofcom that if the price controls applying to BT access and core network services are set in this way, and if investment in an NGN network would be expected to result in lower costs overall, BT would have a financial incentive to make this investment. CPW made the same point. In particular, CPW said that if the delivery of services by the use of new technology could be expected to be cheaper, then setting prices based on future or legacy technology costs should make no difference to the incentives (see paragraph 3.33 above).

3.39 Second, CPW argued that NGN investment would be inefficiently delayed because BT would, with Ofcom's approach, be unable to recover the costs of providing WLR

[37] CPW W/S Houpis VI, §9.
[38] CPW W/S Houpis III, §§29 & 30.
[39] CPW W/S Houpis VI, §9(d)(i).
[40] CPW W/S Houpis VI, §§24–26.

services using NGN technology (see paragraph 3.34 above). We do not agree with this because the total revenue raised from the charges being set (ie those for MPF, SMPF and WLR services) would be the same with both CPW's and Ofcom's approaches since the total revenue raised by the charges for MPF, SMPF and WLR services was determined by Ofcom's use of the Oak model. This method of establishing total revenues was not challenged. What is in dispute here is just the structure of charges, ie the relative charges for MPF, SMPF and WLR. As a result, CPW's NGN-cost-based approach would not provide more funds for financing NGN investment in the access network. Other arguments put forward by CPW were explicitly conditional on Ofcom's approach applying more generally beyond merely the structure of prices (see paragraph 3.34 above).

3.40 We consider this to be important as the incentives to invest in new technology in the access network created by different approaches to setting CRS charges will be determined less by the structure of charges and more by the overall level of revenues raised by the charges. We recognize that if actual line volumes differ from the assumptions made in the model, then a different structure for charges would be likely to result in a difference in the total revenue generated by CRS services, but we consider this effect to be of secondary importance as it would be limited to the price control period and the size of the variations from the volume forecasts. In its response to the provisional determination, CPW disagreed with our view on the structure of charges. CPW argued that if BT's ability to recover any under-recovery of WLR costs from MPF and SMPF line rental were undermined by a loss of MPF and SMPF volumes to other platforms there would be an effect on BT's investment incentives. CPW's argument was that Ofcom's approach would, in practice, result, over time, in an under-recovery of CCA FAC costs as BT could not sustain MPF and SMPF line rental volumes at the price levels allowed by the price controls. CPW had not previously made this argument or presented evidence to support this case. However, we would expect reductions in line volumes to be reflected in volume projections—as was the case in this price control period.

3.41 Third, whilst we agree with CPW[41] that, generally, incentives are strongest when price controls are set independently of actual behaviour or performance, in practice, regulators are frequently required to strike a balance between maintaining incentives and the need periodically to reset charges so as to ensure that they allow firms to recover efficiently-incurred costs or consumers do not pay excessive prices. This approach is expected to give companies an incentive, in the form of higher profits, during the period between reviews to become more efficient and in so doing to reveal the efficient costs that can be reflected in future price controls, to the benefit of consumers.

3.42 In this case, Ofcom said that the level and structure of prices would, for a period, be set by reference to existing technology costs, even if BT were to invest in new technology over this period. Charges would be brought into line with the costs of this new technology only when it was established and, even then, this would be achieved gradually by a glide path. It is this deliberate regulatory lag that creates the financial incentive to invest in cost-reducing technology, as BT would retain the cost savings in these years in the form of higher profits.

3.43 In its response to the provisional determination, CPW said that Ofcom's 'legacy cost' approach, when Ofcom knew at the time of setting the price control with a reasonable degree of certainty that the move to NGN would lead to overall lower costs, unequivocally allowed BT to retain excessive profits from moving to NGN, which was

[41] See CPW W/S Houpis VI, §9(c)(ii).

economically inefficient. CPW's argument relies on Ofcom being certain that NGN investment across BT's network including its access network is the efficient way forward. For the reasons given in 3.37 to 3.51, 3.75 to 3.84 and 3.96 to 3.110, we do not accept CPW's arguments that an efficient BT would have rolled out NGN to its access network and that, as a result, Ofcom could not be certain that BT would move to NGN. CPW, in its response to the provisional determination, also said that it was notable that the European Commission, in its *Recommendation on the Regulatory Treatment of Fixed and Mobile Termination Rates in the EU* of 20 May 2009[42] (published just two days before Ofcom's LLU Statement), observed (at recital 12[43]) that: 'the cost model should be based on the efficient technological choices available in the time frame considered by the model, to the extent that they can be identified. Hence a bottom up model built today could in principle assume that the core network for fixed networks is Next-Generation-Network (NGN)-based'. In our view, this statement is consistent with Ofcom's approach. Ofcom's 'cost models are based on the efficient technological choices available …. to the extent that they can be identified'. Also, the last sentence in the text highlighted by CPW refers to 'could': it states that 'bottom up cost model **could** in principle …. NGN-based' (emphasis added).

3.44 Fourth, we consider that CPW's approach of setting prices independently of the technology employed by BT would be difficult practically as it would require a good external benchmark for BT's efficiently-incurred costs. CPW argued implicitly that other networks, including its own, provided a benchmark against which to determine the efficient deployment of technology. CPW referred to what it and other network operators in the UK had done in its argument that NGN was the efficient technology for providing access services. In response to the provisional determination, CPW said that new entrants were good benchmarks provided that account was taken of the speed of migration (which could be done through the use of a glidepath or other means). For the reasons given below (paragraphs 3.75 to 3.81), we do not consider that the other UK fixed-line telecommunications networks provide a good benchmark against which to compare BT in determining whether it would be efficient for BT to invest in NGN equipment in its access network. CPW also accepted that other networks might not be reasonable benchmarks against which to compare BT.

3.45 Fifth, we considered CPW's argument that Ofcom had adopted an inconsistent approach: Ofcom had stated that it adopted a legacy approach when it actually used NGN costs to estimate line-card costs for WLR lines.[44,45] We recognized that Ofcom made a number of references in the LLU and WLR Statements to this issue. We consider that the key references are those made in the WLR Statement where there is a more detailed discussion of Ofcom's approach and reasoning. The WLR Statement is also the most recent of the two decisions published by Ofcom.

3.46 In the WLR Statement, Ofcom explained that it used the costs of NGN technology in estimating the line-card costs in the WLR costs using a weighted average of PSTN line-card costs, as reported in the CCA accounts, and combi-card costs. Ofcom explained in the WLR Statement that, in the absence of reliable information on the future costs of maintaining PSTN line cards, this approach was used as a proxy for these costs**.** By comparing the results with line-card costs reported in previous

[42](2009/396/EC) OJ 20.5.2009 L 124/67.
[43]See also Recommendation 4.
[44]Heaney said (CPW W/S Heaney VII, §15) that 'It appears that it was this delay in BT's roll-out plans, subsequent to the Second Consultation, that accounts for the shift in Ofcom's view in the WLR Decision and in the Defence that legacy / TDM costs should be used to calculate BT's costs'.
[45]CPW WLR bilateral hearing transcript, p36, lines 12–24.

Regulatory Financial Statements, Ofcom said that it satisfied itself that this approach was reasonable.[46]

3.47 We considered that this approach to estimating the line-card costs was consistent with Ofcom's legacy costs approach. We recognized, however, that in the LLU Statement Ofcom gave a different description of its approach to estimating the line-card costs included in the WLR costs. In particular, Ofcom said that it proposed that the WLR charge be set to recover both the legacy and PSTN cards costs and a contribution to the combi-card costs as they were phased in.[47] Ofcom considered this to be a reasonable approach to the recovery of combi cards as it took account of the fact that voice-only customers did not benefit from the investment in them.

3.48 We also noted that in some places in the WLR Statement. Ofcom made reference to BT's decision to suspend plans to roll out 21CN and that following this, Ofcom considered what the costs would be of maintaining the existing TDM technology and considered that the weighted average of the PSTN line cards and per-service allocation of the 21CN costs could be used as a proxy for this.[48] However, Ofcom also gave an alternative interpretation of this approach as considering a case where BT replaced the PSTN line cards with combi cards as part of a plan to replace the PSTN network and that, in this case, the combi cards would be the MEA adjusted to reflect their additional functionality.[49]

3.49 Our view is that whilst some of the references made by Ofcom as to how it estimated line-card costs may appear to some as inconsistent, we consider that the approach that Ofcom in fact adopted was consistent with its legacy cost approach. In particular, Ofcom concluded that, for reasons of consumer protection and efficiency, it would be appropriate to limit costs recovered from voice-only service to the level that would be implied by the hypothetical continued use of the existing technology which it estimated as set out above.[50]

3.50 Finally, we agree with Ofcom that if the differential between charges for WLR+SMPF and MPF reflected the relative legacy technology costs, this would provide efficient incentives for CPs to invest in new technology. In particular, CPs would have a financial incentive to switch to MPF products, which would require them to invest in MSANs, if by doing so they could reduce their costs of delivering voice and broadband services or offer their customers a better service at a price that would more than compensate them for any additional costs incurred.

3.51 In its response to the provisional determination, CPW said that the CC had not shown that using the legacy cost approach improved incentives for BT to invest in NGN (merely that using legacy cost did not create strong disincentives). However, this is not a proposition we are required to demonstrate. As discussed at .1.58, our role is to determine whether CPW has demonstrated that Ofcom has erred for the reasons set out in the NoA. For the reasons given in paragraph 3.37 to 3.51, we do not consider that CPW has shown that Ofcom's legacy cost approach would create a disincentive for BT to invest in new technology[51] and could result in NGN investment being inefficiently delayed.[52]

[46]WLR Statement, §5.38.
[47]LLU Statement, §§6.187 & 6.188.
[48]WLR Statement, §5.37.
[49]WLR Statement, §5.39.
[50]WLR Statement, §5.43.
[51]CPW W/S Houpis VI, §9.
[52]CPW W/S Houpis III, §§29 & 30.

The effect of CPW's approach on charges for voice-only customers

3.52 Ofcom accepted that, if BT were to adopt NGN in local exchanges, it might be appropriate for the prices of some services to increase.[53] Ofcom and CPW do not therefore disagree that, if BT were to invest in a new technology—such as NGN—that resulted in a change in cost structure, that this could lead to some customers paying higher prices.[54] However, under Ofcom's approach, this question would only need to be addressed when the investment in new technology had taken place.

3.53 Ofcom said that CPW's approach would result in some customers paying higher prices during the price control for voice services that were no different from before, at a time when no CPs or their customers were receiving the benefits associated with the use of NGN technology in BT's access network. Ofcom said that this common sense illustration showed that CPW's application of MEA principles was incorrect.

3.54 In response, CPW argued that it would not be against the interests of voice-only customers to set prices for WLR lines based on NGN costs because:[55]

- WLR prices being set on the basis of costs which reflected appropriately the efficient MEA costs would be consistent with a significant number of current voice-only customers paying less for the voice services they consumed, and an even greater number of voice-only customers paying less over their total time as customers. This effect was a result of lower usage charges and an expectation that many current voice-only customers would become voice + broadband customers.

- setting prices based on NGN costs would reduce the risk of a slow deployment of NGN, leading to improved productive efficiency for the delivery of both voice and broadband services;

- setting the WLR charges on a legacy cost basis would discourage competitors (including mobile network operators), which would be able to offer voice services potentially more efficiently than BT;

- setting the WLR charge on a legacy cost basis was also much more likely to lead to inefficient consumption of services delivered using NGNs; and

- to the extent that it was necessary to protect vulnerable consumers from any potential price increases, there were other instruments available to Ofcom which could achieve this objective with significantly less market distortion.

3.55 We do not accept these arguments for the following five reasons.

3.56 First, we consider that CPW was wrong to consider the overall impact on customers of voice services of investment in NGN in the core and access networks. CPW's argument is that higher WLR charges would be offset by lower usage charges.Absent any increased investment in NGN (see paragraphs 3.37 to 3.1), the different structure of charges for access services proposed by CPW of itself would not give rise to lower usage charges. We consider therefore that any benefits to customers from lower usage charges relating to NGN investment cannot be attributed to higher WLR charges.

[53]Ofcom WLR bilateral hearing transcript, pp46&47.
[54]CPW W/S Houpis III, §24, does not disagree with Ofcom that prices for some services will rise.
[55]CPW W/S Houpis III, §40.

3.57 Second, we do not agree, for the reasons given above (see paragraph 3.37 to 3.51), that setting prices based on legacy technology would result in inefficient delay in deployment of NGN technology by BT in the access network.

3.58 Third, we do not agree that Ofcom's legacy cost approach will undermine efficient competition in the provision of voice-only services by not providing MPF-based CPs or mobile networks with sufficient margin to allow them to compete profitably with BT in the provision of voice-only services.

3.59 For the reasons given above (see paragraphs 3.37 to 3.51), we consider that Ofcom's approach would provide efficient incentives for CPs providing fixed-line services, or operators of mobile networks, to provide voice-only services in competition with BT Retail. In particular, if they are able to reduce the costs of providing voice-only services by using new or different technology they would be able to undercut BT or other CPs providing voice-only services using WLR lines.

3.60 In addition, we agree with Ofcom[56] that, unless there are strong competition arguments for doing so, to set a differential in order to allow MPF providers to compete with WLR-based providers in the provision of voice-only services could encourage inefficient investment in MPF services resulting in higher costs being incurred in the provision of voice-only services (see Section 3: Part 2, paragraphs 3.242). We have seen no evidence that there would be strong competition benefits from encouraging MPF-based delivery of voice-only service. Ofcom said that it had recognized this in its recent retail narrowband market review statement and, as a result of the growth in competitive pressures based largely on the use of WLR, it had now deregulated the retail narrowband market.[57]

3.61 In its response to the provisional determination, CPW disagreed with our view. It reiterated that there were unequivocal advantages resulting from voice competition based on MPF rather than WLR due to greater ability for innovation and greater cost pressure across more of the value chain. CPW said that Ofcom and BT agreed that by using MPF, an operator could innovate in the provision of voice services to a greater degree than it could with WLR, and CPW referred to statements made by both BT and Ofcom to support this view. CPW referred to a statement made by BT in the course of this appeal (see paragraph 2.72): 'Such benefits were not therefore confined to MPF, although an MPF operator may have more scope for innovation across a broader range of services than by using WLR alone'. BT further stated that 'CPW did not reflect the importance of WLR in also providing these benefits [innovation and choice] to consumers'. Also BT's statement set out that 'MPF … may have more scope for innovation …'. CPW referred to Ofcom's Second Consultation[58] where Ofcom states that its 'view is that in the short and medium term MPF is likely to become increasingly important to the future of broadband competition'. Ofcom also states that 'most of the broadband competition from LLU is currently through SMPF, rather than MPF. …. This raises the question of how important the level of the MPF charge is for broadband competition, given that SMPF is currently the dominant form of LLU'.[59]

3.62 Our view remains unchanged. As we state above, no party to this appeal has shown that, given the strength of competition in the provision of voice services, there would be strong competition benefits from encouraging MPF-based delivery of voice-only

[56]Ofcom LLU Defence, Annex D, §39.
[57]WLR Statement, §5.92.
[58]Second Consultation, §A5.75.
[59]Second Consultation, §A5.83.

services which would be sufficient to outweigh the potential costs of encouraging inefficient use of MPF lines to provide voice-only services.

3.63 CPW also contended that we had not recognized the benefits in competition with WLR for wholesale line rental services which would result in deregulation. In CPW's view, this would be similar to the way in which LLU allowed competition with wholesale broadband (eg IPStream) which allowed the Wholesale Broadband Access market to be deregulated. This is a claim that CPW has not raised before in this appeal and as such is not an argument that we consider forms part of CPW's pleadings. However, as considered above we note that CPW has not demonstrated that the benefits of deregulation would be sufficient to out-weigh the potential costs of encouraging inefficient use of MPF lines to provide voice-only services.

3.64 We do not accept that Ofcom's approach would result in the inefficient consumption of voice-only services. CPW's argument relies on accepting that NGN is the efficient technology for BT. CPW made a number of other arguments similar to those listed above[60] which we also consider relied on CPW demonstrating that NGN is the efficient forward-looking technology for BT. For the reasons given below (paragraph 3.110), we do not believe that CPW has demonstrated this.

3.65 Finally, with regard to the last of CPW's arguments as listed above (paragraph 3.54), Ofcom stated that its position was not about the protection of vulnerable consumers. We accept Ofcom's position.

(ii) The efficient forward-looking technology: NGN or legacy

Introduction

3.66 We considered CPW's argument that the efficient forward-looking costs were those based on the use of NGN technology.

3.67 CPW argued that the efficient, forward-looking costs would be the costs of operating a single NGN network for both voice and broadband services for all customers. CPW also argued that the appropriate cost benchmark was determined by the technology that would be used by a new entrant. In particular, CPW said that the objective in setting charges was to mimic the competitive market and to send efficient price signals to efficient new entrants, all of which used NGN.[61]

3.68 CPW said that the use of NGN by other operators (principally CPW and Sky), and the fact that legacy technology equipment could no longer be bought new and so was not an option for a hypothetical new entrant, was evidence that NGN was the efficient forward-looking technology.

3.69 CPW claimed that the evidence was overwhelming that NGN was the most efficient technology.[62] In particular, BT had stated publicly that it planned to adopt fully a combined NGN until its announcement in March 2009. CPW said that these plans were implicitly accepted as realistic in Ofcom's modelling and statements at the time of the WLR consultation.

3.70 CPW said that the ERG[63] had stated in 2008 that NGN was expected to be the technology that would be used. CPW suggested that there were reasons why an in-

[60] For example, see CPW W/S Houpis III, §30.
[61] CPW letter to the CC of 12 May 2010.
[62] CPW W/S Heaney VII, §23.
[63] Now known as BEREC.

efficient operator might have changed strategy, including a shortage of capital and implementation difficulties, which CPW felt were exaggerated by ineffective management at BT.[64]

3.71 In Ofcom's view, the most cost-effective way for Openreach to provide voice access services for the period of the charge control was to maintain the existing technology.[65]

3.72 Ofcom said that the emergence of a business case for NGA had reduced the long-term benefits of Openreach moving to NGN, particularly in the access network, by making certain NGN equipment (MSANs) redundant.[66]

3.73 BT said that it was continuing to roll out NGN as planned for other services, but that it had suspended the roll-out of voice services delivered over NGN. BT stated that it did not consider NGN to be the efficient technology for voice access services.[67] BT said that it had changed its approach to NGN while developing its NGA programme. BT also said that it was, for now, more efficient to continue using its existing equipment and that, going forward, it was likely that the next generation of equipment would be fibre-based.[68]

3.74 Sky said that, if a new network were being built, NGN would be the appropriate technology.[69] Sky noted that BT had an old voice network which required minimal capital expenditure and, while it incurred slightly higher operating expenditure than when new, it continued to generate a high return. Sky noted that Virgin Media also had a legacy network which Virgin Media had found efficient to keep in operation for voice customers rather than moving fully to NGN or cable. Sky also recognized that the choices that Openreach, with its existing network and large customer base, might need to make would be different from those of Sky.[70] Sky also said that NGA had reduced the incentives for operators to use MPF, because new fibre-based products increased the relative attractiveness of alternatives to the MPF-based model.[71]

Assessment

3.75 We consider that the relevant cost benchmark should be determined by reference to what would be efficient for an operator in BT's position. We do not consider that CPW has demonstrated that an efficient BT[72] would have continued to roll out NGN to the voice access network as was BT's plan up until March 2009:

- We do not consider that CPW's reasoning that legacy technology equipment could no longer be bought new can be applied to BT, because BT continues to have the option of maintaining its legacy access network. Also, the assessment of whether to use a legacy network will be very different for BT because it has a large installed customer base for WLR lines. In addition to the time taken to migrate customers, BT said it would face additional costs (eg costs of parallel running) and operational challenges to migrate customers to NGN compared with new entrants.

---

[64] CPW W/S Heaney VII, §§20 & 21.
[65] Ofcom Defence, Annex, §§23 & 24.
[66] Mr Clarkson at p16, lines 1–5, of the Ofcom WLR bilateral hearing transcript of 6 May 2010.
[67] BT W/S Esslin-Peard II, §29.
[68] BT WLR bilateral hearing transcript, 12 May 2010, p24, lines 12–16.
[69] Sky WLR bilateral hearing transcript, 13 May 2010, Mr Higho, pp16–19.
[70] Sky WLR bilateral hearing transcript, 13 May 2010, Mr Higho, p14.
[71] Sky WLR bilateral hearing transcript, 13 May 2010, Mr Higho, p25.
[72] While Ofcom is setting the prices by considering the actions of an efficient Openreach, the main decision about NGN investment (that will affect the network that Openreach must link to) will be taken by BT. Thus we are considering whether BT as a whole has taken the efficient approach to NGN investment.

- In assessing Ofcom's decision, we consider that information emerging after the WLR consultation, and in particular leading up to BT's March 2009 announcement, should be accorded significant weight.

- We consider that the ERG advice on asset valuation is of limited relevance in assessing the efficient choices for Openreach.

- We do not accept CPW's argument that NGN costs provide a more reliable basis for estimating the forward-looking costs of providing WLR services.

3.76 Our reasoning on each of these issues is set out below.

- *Use of other UK operators as a benchmark*

3.77 Our view is that CPW's evidence that NGN is the more efficient technology was primarily based on the perspective of new entrants and had limited relevance for considering the efficiency of BT's investment plans.

3.78 We do not accept that the appropriate cost benchmark is determined by the costs of a new entrant. In particular, the implication of CPW's argument is that in competitive markets the price is determined solely by the potential competition from new entrants. We do not accept this. In a competitive market the constraints may be from potential competition, from new entrants and/or from actual competition among incumbents. In addition, to set the price controls, as CPW suggested, that would allow efficient new entrants to be able profitably to provide voice services[73] would not be in the interests of consumers if this would result in a higher price than would be the case were it determined by reference to costs of the existing operators. In its response to the provisional determination, CPW said that we had misunderstood its position. CPW said that the structure of prices in a competitive market would be expected to reflect the structure of the forward-looking, efficient costs and that forward-looking, efficient costs would be reflective of the cost structure that would be expected to apply to a new entrant.[74,75] For the reasons given in paragraph 3.77 to 3.81, we do not agree with CPW that what is the efficient technology for a new entrant network operator to employ would necessarily also be the efficient technology for an operator with an existing legacy network.

3.79 We also consider that the arguments that CPW has advanced on this point were inconsistent. In the LLU NoA, CPW said that costs should be based on BT's additional costs for providing WLR instead of MPF or WLR+SMPF instead of MPF, and not on a new entrant, such as TTG.[76] CPW also stated that there were unlikely to be any new entrants into the market.[77] Finally, CPW referred to the technology employed by CPW and other existing operators, and to BT's own investment plans in making its case that NGN was the efficient forward-looking technology.[78]

3.80 We also consider that other existing telecommunications network operators do not provide a good benchmark against which to compare BT in this context. One reason for this is the different mix of services provided using the BT network and, in particular, a significant number of voice-only customers . CPW stated that the costs

[73]CPW letter to the CC dated 12 May 2010.
[74]CPW's submission on the CC's provisional determination on the WLR Appeal, 29 July 2010.
[75]CPW told us that for the avoidance of doubt, the term 'new entrant' was used in this context to describe operators other than BT.
[76]CPW W/S Heaney I, §222e.
[77]CPW WLR bilateral hearing transcript, Dr Houpis, p31.
[78]Dr Houpis said that new entry was very unlikely—CPW bilateral hearing transcript, 30 April 2010, p31. CPW stated that some of its comments about other operators related only to network-based MPF operators—CPW letter, 1 June 2010, paragraph 14.

of NGN networks were driven by the number of subscribers connected and that they were less responsive to usage.[79] Networks with mostly high-usage customers were thus more suitable for NGN than networks where there were many low-usage customers, such as voice-only customers. CPW's discussion of whether voice-only customers would benefit from an NGN implied that voice-only customers used conveyance services less intensely than others.[80] For example, CPW referred to its own adoption of MPF-based services, and Sky's adoption of similar services, as evidence that efficient operators would use this technology.[81] We did not consider this comparison to be relevant because these telecommunications firms are potentially more similar to new entrants than to BT in terms of their investment incentives.[82] For example, both these firms have few or no voice-only customers.[83] In its response to the provisional determination, CPW said that whilst BT might have a relatively higher share of voice only customers, it was with the knowledge of this that BT announced its plan to move to the NGN and the expected cost savings from this. Whether or not all operators have an incentive to compete for all types of customers is not relevant to our reasoning on this point. We consider that one reason why it may be efficient for other fixed-line network operators, such as CPW, to invest in NGN-based services, using MPF lines, but not efficient for BT to invest in NGN in its voice access network is the differences in the mix of services provided using the BT network. The cost benefits of NGN technology are largely in the core network from economies of scope in the provision of voice and broadband services on one platform.[84] If WLR lines are being used (by BT Retail or rival CPs) to provide voice-only services, these benefits will not be realized. We know that around half the WLR lines are currently used for voice only-services (rather than in conjunction with SMPF lines to provide voice and broadband services).

3.81 CPW referred to the Ofcom consultation in July 2009 which stated that an NGN as a single network was cheaper to build and run than the current approach of having separate networks for each service.[85] We consider that it is far from clear that Ofcom intended this statement to apply to incumbent operators. We also noted that Ofcom said that NGN could reduce network duplication even without replacing the voice access network,[86] and that 'there are risks that NGN investment will deliver neither cost savings nor new products', and Ofcom reached no conclusion as to whether investments in NGN by operators with existing networks would deliver cost savings.

- *Relevance of ERG statements*[87]

3.82 CPW referred to a section of the ERG report on asset valuation that said, 'The MEA will generally incorporate the latest available and proven technology, and will therefore be the asset that a new entrant might be expected to employ'.[88]

[79]For example, CPW W/S Houpis III, §26.
[80]CPW W/S Houpis III, §§34–40.
[81]CPW W/S Heaney VII, §17.
[82]It is possible that CPW (and Sky) are also subject to the gaming incentives that CPW referred to.
[83]CPW accepted that (at current prices) there was little demand for voice-only services from entrants such as itself (although it noted that there would be more voice-only customers provided by entrants if the xMPF was introduced)—CPW W/S Heaney VII, §85.
[84]See, for example, BT WLR bilateral hearing transcript, 12 May 2010, p29 lines 4–13. See also paragraph 93.
[85]CPW W/S Heaney VII, §17, referring to 'Next Generation Networks: Responding to recent developments to protect consumers, promote effective competition and secure efficient investment', Ofcom consultation, 31 July 2009, §§1.11–1.13.
[86]Ofcom WLR bilateral hearing transcript, 6 May 2010, Mr McIntosh. Many EU core networks use IP (p13) but BT currently has both a PSTN voice and IP broadband core network (p16).
[87]The ERG is now known as BEREC.
[88]ERG 29 (2005) *ERG common position: Guidelines for implementing the Commission Recommendation C(2005) 3480 on Accounting Separation & Cost Accounting Systems under the regulatory framework for electronic communications*, section 4.2.2, Long Run and Forward Looking.

3.83 Our understanding of this statement is that the MEA, once proven, is the technology one would expect a new entrant to employ. However, this statement does not say whether one would expect the technology that a new entrant would use to be the same as that used by an efficient incumbent operator.

3.84 CPW said that Ofcom should take account of the statements of the ERG unless there was good reason not to.[89] CPW accepted, however, that overall the ERG guidelines on the application of MEA were not so helpful in the current context. In particular, CPW said that the ERG guidance, to which it had referred, as to how the MEA concept should be implemented in practice appeared to refer to the CCA revaluation of legacy assets and was therefore less relevant and potentially confusing (see also paragraph 3.26).[90]

- *Evidence on the reasons for BT's March 2009 announcement*

3.85 CPW gave some possible reasons as to why BT delayed the roll-out of NGN that were not related to the efficiency of investment in NGN technology, such as BT's policy of no compulsory redundancies which restricted its ability to achieve the operating cost savings promised by NGN.[91,92]

3.86 Sky said that other European incumbent operators were further down the route to NGN, such as France Telecom, but this progress was partly due to them also operating mobile businesses.[93]

3.87 BT acknowledged that its plans to migrate WLR products on to a 21CN or NGN network were only dropped formally in March 2009.[94] BT referred us to the Pathfinder trial that led to the March 2009 announcement that NGN would be scaled back.[95]

3.88 CPW claimed that the main reason for the change in BT's plans for implementing NGN (other than any effect on Ofcom) was that BT had insufficient capital to invest, due to competing investment projects (notably NGA), the business poor performance and the economic climate. CPW also suggested that there had been implementation difficulties which it felt were exaggerated by ineffective management and would not have affected an efficient operator.[96]

3.89 Ofcom said that other countries had found NGN to give benefits in the core network, but that there had been problems replicating legacy services and migrating consumers on to NGN networks such that BT and other operators had decided that moving to a completely NGN network was not robust.[97]

3.90 Ofcom noted two areas where BT's views on NGN had changed. In particular, interoperability problems had arisen between the planned NGN electrical characteristics and installed equipment such as modems, private exchanges and alarm systems. Also, BT had reached a new ten-year maintenance agreement to keep the PSTN network running.[98]

---

[89] CPW WLR bilateral hearing transcript, 30 April 2010, p49.
[90] CPW letter to the CC, 12 May 2010.
[91] CPW W/S Heaney VII, §§20 & 21.
[92] For example, CPW WLR bilateral hearing transcript, p66.
[93] Sky bilateral hearing transcript, 13 May 2010, Mr Thomas, p17.
[94] BT W/S Esslin-Peard I §25.
[95] BT bilateral hearing transcript, 12 May 2010, Mr Tickel, pp24&25.
[96] CPW W/S Heaney VII, §§20 & 21.
[97] Ofcom bilateral hearing transcript, 6 May 2010, Mr McIntosh, p35.
[98] Ofcom letter of 28 May 2010.

3.91 CPW agreed that some evidence was emerging which indicated that the economic lives assigned to line cards could have been significantly underestimated.[99] Lower costs of retaining the existing network and increased costs of removing that network would increase the desirability of a dual network arrangement.

3.92 CPW referred to evidence in materials which had previously been redacted that CPW said demonstrated both that NGN was the MEA and that the change in BT's plans had been due to financing concerns and internal inefficiencies.[100]

3.93 CPW referred to an April 2008 document[101] as evidence that BT was still planning to go ahead with full NGN and projecting cost savings from NGN of over £1 billion. We noted, however, that this document also stated that [✂], suggesting that BT was not expecting significant cost savings from further investment in NGN.

3.94 CPW also referred to documents which indicated the complexity of moving to NGN, including a March 2008 report[102] from BT's Audit Committee, which suggested that there were delays in the roll-out of NGN due to factors such as installations necessitating retrospective work, and unexpected problems. We noted, however, that these documents could also be seen to be consistent with the interoperability problems highlighted by Ofcom.[103] CPW also commented on the effect of these problems, which it said appeared primarily to be unreliable volume forecasts and a six-month delay in technology development spending and the delivery of NGN broadband products. BT and Ofcom both said that complexity, teething problems and uncertainty were not surprising in a major investment program such as 21CN.[104]

3.95 CPW drew particular attention to BT's document[105] entitled 'Future Voice–Strategic Options' of March 2009, which considered BT's strategy for rolling out 21CN. CPW claimed that this document provided evidence that:

- BT was only delaying, not abandoning, its roll-out of 21CN voice services;
- BT had not found that NGN was not the MEA; and
- the delay to complete migration by December 2012 was due to financial constraints in the economic environment.

We first consider CPW's first and third points and then its second point.

3.96 Ofcom noted that this document highlighted BT's development of NGA.[106] The document discussed the roll-out of the more extensive FTTP product for voice. [✂]

3.97 Ofcom noted from this document[107] that BT had suspended indefinitely its use of access voice products (WBCC and WVC)[108] as these products had proved to be uneconomic.[109]

[99]CPW W/S Houpis III, §50.
[100]See generally CPW's Reply VI.
[101]Referred to in Reply VI as document 3/17/5.
[102]Referred to in Reply VI as document 3/13/2.
[103]Ofcom letter of 28 May 2010.
[104]BT letter responding to CPW Reply VI, 27 May 2010, p15.
[105]Referred to in Reply VI as document 3/31.
[106]ie document 3/31.
[107]ie document 3/31.
[108]Wholesale Broadband Connect Converged (voice and broadband over NGN/21CN) and Wholesale Voice Connect (voice over NGN/21/CN).
[109]Ofcom letter responding to CPW Reply VI.

3.98 This BT document[110] referred to the 'preparation for large scale legacy decommissioning', continuing with pathfinder migrations and 21CN voice services outside South Wales, and offering customers a choice of reliable and cost-efficient voice services on 21CN. We noted, however, that this document also pointed to some of the issues raised by both BT and Ofcom during this appeal, including [✂]. We consider that it is likely that this process resulted in the costs for maintaining legacy equipment being revised down, as Ofcom stated and CPW agreed had occurred. We also noted that the document explained the financial impact of a reduced number of migrations from the legacy network to 21CN, due to lines moving directly to NGA from WLR legacy equipment.

3.99 Ofcom commented that investment in NGA would make the MSANs required for NGN redundant.[111] Ofcom said that it was unlikely that BT would revert to providing NGN-linked access products.[112] Ofcom said that BT was considering 'leapfrogging' MSAN technology.[113] BT agreed that the next generation of line cards would probably be fibre-based, or an IP system might be adopted that did not need line cards at all.[114] BT explained that it had migrated a number of services to 21CN networks, including Ethernet and broadband services, but that there was a discrete investment decision to be made in relation to WLR. The question for BT was whether to make this investment now or to maintain the current technology when BT expected in the longer term there to be a shift towards fibre. BT confirmed that its planned replacement of PSTN line cards had not gone ahead because the continued use of the existing line cards was considered to be more efficient. One reason for this was the likely move towards fibre-based voice services. In addition, there were other options that would not require line cards.[115]

3.100 CPW accepted that NGA investment would limit the remaining life of NGN technology. CPW referred to the comments made by Ofcom in the second consultation[116] that BT's July 2008 plans for £1.5 billion investment in NGA would 'reduce the value of LLU investments and ultimately make it redundant. This could reduce the value of promoting broadband and voice competition based on MPF'. We noted that Ofcom had considered the effect that NGA investment had on the case for NGN investment at the time of the decision.[117] In its response to the provisional determination, CPW told us that NGA would not make an NGN deployment redundant (unless there was 100 per cent NGA uptake). It would merely make NGN investment less compelling. CPW said that current NGA uptake was less than 2 per cent[118] and it had been informed by Openreach that it was planning its NGA deployment for about 20 per cent uptake. On the expected deployment and take-up of NGA, BT told us that it was early days, it had started to make this investment and it had started to see some customer take-up. It had announced a plan to get coverage of 40 per cent of homes by the end of 2012.[119]

3.101 CPW referred to more recent published statements by BT, in which BT stated that it planned to implement 21CN voice products.[120] CPW said that BT had only delayed and had not suspended the roll-out of NGN voice services, including for the access network, and there was no evidence that this delay was due to NGN not being the

[110] ie document 3/31.
[111] Mr Clarkson at p16, lines 1–5, of the Ofcom bilateral hearing transcript 6 May 2010.
[112] Ofcom letter 19 May 2010 commenting on CPW's hearing transcript, p6.
[113] Ofcom letter 28 May 2010, p18, third bullet; p22, third paragraph.
[114] BT bilateral hearing transcript, 12 May 2010, p24, lines 12–16.
[115] BT WLR transcript, 22–25.
[116] CPW W/S Houpis I, §82.
[117] Ofcom 'A new pricing framework for Openreach', Second Consultation, December 2008, §§A5.94 & A5.95.
[118] CPW submission on the provisional determination on the WLR Appeal, footnote 9, 29 July 2010.
[119] Mr Shurmer, BT bilateral hearing transcript, p22, lines 4–12, 12 May 2010.
[120] For example, BT9/CP6 'BT 21CN Deployment Strategy, 15 January 2010, 2.1.3.

most efficient technology.[121] However, we note that in these statements BT gave plans only for completing an initial pilot and, at the same time, discussed examining future voice alternatives due to changes in technology, including voice over NGA.[122]

3.102 BT said that there was no new evidence in the redacted documents. BT stated that in March 2009 it had only delayed the roll-out of 21CN voice due to the economic climate, but that since March 2009 other market developments such as the continuing expansion in plans for NGA meant that plans to use NGN for the access market had been superseded.

3.103 We therefore consider that these BT documents provide evidence that BT's decision to delay the migration to NGN for the access network and to maintain the legacy network was due to a number of factors. We agree with CPW that these provide documentary evidence that, for example, capital expenditure was a factor in that decision. There is no documentary evidence that by maintaining the use of legacy technology BT had hoped to influence the modelling assumptions adopted by Ofcom. We consider that these documents also provide evidence that the factors included the potential for lower-cost options for maintaining the existing network, problems experienced in migrating services to NGN, and emerging plans to extend NGA investment and migrate customers directly from legacy to NGN network. For these reasons, we do not accept CPW's argument that BT's own internal documents constituted persuasive evidence that BT's delaying of NGN investment was inefficient.

3.104 In relation to the second of the points raised by CPW on this document[123], we accept BT's argument that there is no reason why the documents to which CPW had referred should state one way or the other whether NGN was the MEA. We can see no reason why these statements should use this language or directly address this issue. The absence of such a statement does not imply, as CPW suggested, that NGN was the efficient technology.

- *NGN costs do not provide a more reliable basis for estimated forward-looking WLR costs*

3.105 CPW has not demonstrated that NGN would provide a more reliable basis for estimating forward-looking costs. CPW argued that, for Ofcom, estimating legacy costs was subject to greater uncertainty than estimating NGN costs.[124] CPW argued that NGN costs were included in both Ofcom's and BT's modelling and were present in CPW's network, but legacy costs had no readily observable market information and relied on a BT extrapolation of an expired TDM contract.

3.106 We consider that CPW's argument relies on it having demonstrated that NGN is the efficient forward-looking technology for BT to provide all services. For the reasons given above (paragraphs 3.37 to 3.51), we consider that CPW has not done this.

3.107 In addition, we do not accept that the problems Ofcom faced estimating, in particular, future line-card costs invalidate its approach.

[121] CPW comments on the BT hearing transcript under 21CN where CPW referred to delays in the access 21CN, also CPW comments on the Ofcom hearing transcript discussing NGA where CPW said that NGN had been delayed and there was no evidence that the reasons were related to efficiency.
[122] BT9/CP6 'BT 21CN Deployment Strategy, 15 January 2010, 2.1.3, referred to in CPW W/S Heaney VII, §17.d.ii.
[123] ie document 3/31.
[124] CPW W/S Houpis VI, §§19–26.

3.108 Ofcom had difficulty estimating costs of maintaining PSTN line-card costs. Its estimates were made before Openreach's new maintenance agreement was agreed.[125] Ofcom used the cost of combi cards allocated on a per-service basis as a proxy for the cost of maintaining the PSTN line cards.[126] Ofcom satisfied itself that its approach gave reasonable answers by comparing the results of this approach with line-card costs reported in RFS in earlier years.[127]

3.109 In addition, that legacy line cards can no longer be purchased new does not imply that an efficient operator would retire them, particularly if it can maintain the asset at low cost. In estimating the long-term costs of holding the most efficient asset, we consider that the extrapolated information may be more accurate than new information for an alternative asset.

Conclusion as to whether NGN is *the efficient forward-looking technology*

3.110 We are not persuaded that the evidence submitted by CPW supports its case. In particular, we do not accept that the technology used by other UK networks provides a benchmark for determining whether choices made by BT were efficient. In addition, documentary evidence supports a case that there were a number of factors leading to BT's announcement in March 2009, including the impact on the investment in NGA on the case for replacing line cards with MSANs and combi cards. There is uncertainty as to the most efficient technology to minimize operating or investment costs. Given this, we do not agree with CPW that forward-looking costs can be more reliably estimated assuming NGN equipment than using legacy costs.

(b) Did Ofcom make an error in calculating LRIC differentials by not assuming MPF costs to be based on single jumpering?

Introduction

3.111 CPW argued that LRIC estimates should be based on an assumption of 'single jumpering' as a result of a wiring arrangement for MPF that it considered would be more efficient.[128]

3.112 According to CPW, the use of single jumpering would result in the cost of wiring MPF being approximately equal to the costs of wiring WLR rather than the current MPF wiring cost which was approximately equal to the costs of wiring WLR+SMPF. CPW said that this argument was independent of any discussion as to whether the LRIC estimates should be based on those of using NGN technology.

3.113 CPW argued that the current wiring approach for MPF was highly inefficient and that BT should adopt the more efficient single jumpering approach and pass the resultant cost saving on to CPs. CPW estimated (before it had access to Ofcom's models) that the cost savings from using single jumpering would be £6 per line (ignoring the costs of underutilization,[129] which CPW said were not significant and could be passed on to

[125] Ofcom letter, 28 May 2010, p18.
[126] See section on the appropriate adjustment for line-card depreciation.
[127] See section on the appropriate adjustment for line-card depreciation.
[128] Specifically, CPW argued that MPF could be wired with the test access matrix (TAM) in line. This is the equipment for testing the operation of the line and is current attached to the frame (MDF) in the exchange with separate tie cables, but single jumpering involves connecting the line card to the MDF with a single set of tie cables that include a TAM.
[129] BT felt that the small scale of CPs other than itself meant that these CPs would have relatively few single jumpered lines at each exchange. This would mean that these firms faced diseconomies of scale, in particular having MDFs with few lines connected. Even if the cost of utilization were included, this was estimated to be less than 10p per line and would not require an intermediate distribution frame.

CPW).[130] As further evidence that single jumpering was the efficient arrangement, CPW also said that BT was planning to use single jumpering when BT was considering using MPF.

3.114 Frontier estimated that equalizing the capital costs of MDF by assuming the use of single jumpering would have a relatively small impact on the estimated LRIC differentials, increasing the differentials between the LRICs of MPF and WLR by £[✂] and between the LRICs of MPF and WLR+SMPF by £[✂] (Table 3.1).

3.115 Ofcom said that 'it is not clear to us that there is a cheaper arrangement'.[131] Ofcom further argued that, regardless of the most cost-effective technology, it would not be appropriate to set charges for the current jumpering approach based on a different technology because this would remove the incentive for CPs to change to using the new technology. However, in view of our conclusion (paragraphs 3.120 to 3.127), we have not needed to consider this point.

3.116 BT said that single jumpering was not more efficient and that the decision was more complex than CPW had claimed with possible utilization costs.[132]

3.117 BT and Ofcom said that there was an independent industry body—the Products and Commercials Group—that had responsibility for evaluating new products or arrangements.

3.118 BT told us that, under its SMP conditions, there was a procedure for new products called a Statement of Requirement (SOR). BT added that it had not received an SOR from any CP (or an industry request) in relation to single jumpering. BT said that it was normal to receive SORs for new products and it assessed them using a formal process, including a feasibility study. Following this process, its eventual decision could be that the proposal was not a feasible product.[133] BT said that no such request had been made to assess single jumpering.[134]

3.119 BT confirmed that it was going to use single-line jumpering when it originally planned to move to MPF as part of 21CN but then re-evaluated its decision and continued with WLR.[135]

Assessment

3.120 We do not consider that Ofcom erred in estimating the LRIC differentials by reason of it assuming the current wiring arrangement for MPF rather than a single jumpering arrangement.

3.121 Neither CPW nor any other industry participant has made an SOR to BT and thus a feasibility study has not been carried out. Given that the industry process for a new product request has not been carried out and there are differing views on the efficiency of single jumpering, Ofcom did not err in the assumption that it made.

3.122 On the evidence provided, we are not persuaded that single jumpering would be a more cost-effective wiring arrangement. In particular, we note BT's observation that to determine whether this would be a more efficient approach would be more com-

[130] CPW W/S Heaney VII, §§31–53.
[131] Mr Clarkson, Ofcom bilateral hearing transcript, p75, lines 32&33, 6 May 2010.
[132] Mr Shurmer, BT bilateral hearing transcript, p35, lines 14&15, 12 May 2010.
[133] BT bilateral hearing transcript, pp31–35, 12 May 2010.
[134] Mr Brown, Ofcom bilateral hearing transcript, p77, lines 1–10, 6 May 2010.
[135] BT bilateral hearing transcript, 12 May 2010, p32, Mr Dolling.

plex than CPW suggested.[136] We also noted the uncertainty among the parties about the size of the cost saving to be gained from single jumpering. The latest Frontier estimates even for the savings related to MDF were different to CPW estimates.

3.123 In addition, the evidence provided by BT and Ofcom was that requests for changes to current arrangements such as a move to single jumpering would be a matter for the industry following an SOR request to the Products and Commercial Group. We consider it to be significant that no such request was made by CPW, despite its strong view as to the benefits of single jumpering over several years, or by any other industry participant.

3.124 CPW argued that there was no obligation on BT's customers to explain to BT how to act efficiently and that it was therefore irrelevant that there had been no formal SOR request to Openreach.[137] CPW also claimed that customers of BT had limited information as to how BT operated. We consider that CPW has been inconsistent on the latter of these two points. CPW stated clearly in this case that single jumpering was the most efficient approach.[138] We also note that CPW has not given any reason for not making an SOR given that an industry process is in place for this purpose. Even if BT did not immediately introduce the product, a feasibility study would be carried out which would clarify the most efficient approach and assist Ofcom.

3.125 BT provided revised figures for the frame costs reported in its RFS that had been used by Ofcom in calculating its LRIC differential.[139] The frame costs are the main cost element that are affected by the wiring approach assumed.CPW suggested that the uncertainty in the frame cost figures showed that the models had not been properly scrutinized.[140] We noted that the corrections put forward by BT would have the effect of reducing Ofcom's estimate of the LRIC differentials.[141]

3.126 In the response to the provisional determination CPW said that using the estimate CPW provided for the cost saving of single jumpering was clearly preferable to assuming zero cost reduction when neither Ofcom nor BT had presented robust evidence for this and BT had not explained why single jumpering would be less appropriate for other CPs than it was for BT. CPW said that the submission of an SOR was not relevant and Openreach submitted internal SORs and could have requested single jumpering itself to improve efficiency. In addition, we note that CPW did not present any calculations to rebut the arguments made by Ofcom and BT until WS Heaney VII. For example, in the WLR Statement at §5.60, Ofcom stated that cost savings due to single jumpering were not obvious due to the need for an intermediate distribution frame.

3.127 We consider that the position that Ofcom took in the decision in relation to single jumpering was reasonable given the absence of an SOR and therefore a feasibility study or other evidence that single jumpering would be a more efficient method of wiring MPF.

---

[136]BT bilateral hearing transcript, 12 May 2010, p32, Mr Dolling.
[137]CPW letter, 25 May 2010, §37.
[138]For example, see CPW W/S Heaney III, §17.
[139]BT letter, 28 May 2010, on frame costs.
[140]CPW letter, 1 June 2010, §20.
[141]For the MPF vs WLR, the differential would be –£3.40 rather than Ofcom's assumed –£2 to £0. For WLR+SMPF vs MPF, the differential would be £0 instead of Ofcom's range of £0 to £3.

(c) In calculating LRIC based on legacy costs, has Ofcom made an error by not taking sufficient account of the age and depreciation profile of line cards and tie cables?

Introduction

3.128 CPW initially said that the depreciation charges in BT's accounts were too low for line cards and tie cables because these assets were being used beyond their reported asset lives. CPW said that this had affected the LRICs Ofcom calculated for these assets.[142] The arguments in relation to tie cables were dropped in later submissions.

3.129 CPW noted that Ofcom had accepted that there were only small amounts in Ofcom's cost figures for depreciation of tie cables.[143] When CPW estimated the LRIC for tie cables, it used a tie cable with an in-line TAM that would be suitable for single jumpering, and it estimated that the additional cost of WLR (compared with MPF) would be £3.[144] CPW later said that its arguments in relation to tie cables were solely related to the technology that should be used (ie that a tie cable suitable for single jumpering would add £1–£2 to the LRIC).[145] Ofcom noted that CPW had suggested a difference in LRIC of £3 but said that the remaining difference was due to the number of cables that CPW assumed due to the single jumpering assumption.[146] No explicit adjustment was made for tie cables in the Frontier model.[147] Frontier also stated that CPW's arguments in relation to tie cables concerned only the single jumpering issue (for which adjustments were made). Our understanding is that CPW has dropped arguments made in its NoA in relation to the treatment of fully depreciated tie cables.

3.130 CPW also explained that line cards had been depreciated in BT's accounts using CCA depreciation, where the capital charges fell over the lifetime of the asset as capital employed fell. Assets that remained in service past the end of their assumed useful lives generated no capital charge as the capital employed was zero and there was no depreciation charge.[148]

3.131 CPW said that, for other assets, the existence of fully depreciated assets would not cause the LRICs to be incorrect because, where assets were installed and replaced on a continuous basis, the high charges for recently installed assets would balance against the low charges for assets near the end of their life. Assets that remained in operation past the end of their assumed life would be balanced by assets that were removed from service early. However, CPW noted that in the case of line cards there had been few recent purchases so there were insufficient new line cards to balance out the effects. Since there had been no major changes in switching technology in the last ten years and little growth in voice lines, with a decline forecast, there had been no mass upgrading or purchase of cards. Furthermore, BT's plans to maintain the TDM network indicated that the rate of failures was low.[149]

3.132 CPW argued that because the majority of BT's existing line cards were old, with low or zero capital charges, Ofcom's estimates of the LRIC for WLR lines would be in-efficiently low because the CCA FAC figures would underestimate the economic cost of the assets.

---

[142]CPW W/S Heaney I, §§248–251.
[143]CPW LLU NoA, §96.2.
[144]CPW W/S Heaney I, §§248–251.
[145]CPW W/S Heaney VII, §57.
[146]WLR Statement, pp5.64–5.69 and Figure 5.1. Ofcom letter 28 May 2010, p7.
[147]Frontier/CPW, 27 April, p18.
[148]CPW W/S Houpis III, §50a.
[149]CPW W/S Houpis III, §50.

3.133 CPW stated that the useful economic life of line cards could have been significantly underestimated.[150] Ofcom noted that line cards were depreciated over a ten-year life and BT was now expecting to maintain PSTN line cards for a further ten years, despite the lack of new line cards since 1998.[151]

3.134 Ofcom said that it had based its line-card LRIC estimates on the CCA FAC estimates using BT's forecast mix of PSTN (TDM technology) line cards and per-service allocation of 21CN combi cards, and then used these values as proxies for the costs of continuing with PSTN line cards. Ofcom said that it considered the resulting costs to be reasonable as they were within the range of recent experience.[152] The 2012/13 figure was based on BT's blended figure.[153] Given that, historically, LRIC costs were about 90 per cent of CCA FAC costs, Ofcom then calculated that, on the basis of a CCA FAC figure for 2012/13 of £12.30, the LRIC was approximately £11.[154]

3.135 Ofcom recognized explicitly in the WLR statement that it was possible that this calculation might underestimate the LRIC because of the existence of fully depreciated assets. Therefore, it made an adjustment and considered the LRIC to lie in a range from £11 to £13. The WLR Statement did not provide any evidence for the size of this adjustment.

3.136 Ofcom provided a graph to show that the revised line-card LRIC was in line with previous years' figures and was therefore reasonable. Ofcom noted that there were relatively few observations due to changes in accounting practices and those estimates that were available included some combi cards in the latter two years because of trials of this technology.[155]

Assessment

3.137 We do not consider that Ofcom erred in forecasting the costs of line cards using CCA data as claimed by CPW. The estimate Ofcom used (£11–£13) took account of the fact that a large proportion of the line cards are fully depreciated.

3.138 In considering CPW's arguments, we recognized two effects of BT continuing to use fully depreciated PSTN lines cards. First, if many of the line cards being used are fully depreciated, the more recent CCA FAC figures for line cards would tend to underestimate the LRIC as these would make no allowance for the cost of capital or depreciation of these assets. Second, because the economic life of the line cards had exceeded the length of time over which they were depreciated (which was ten years), historic CCA FAC figures may overstate the LRIC by depreciating the assets over too few years.

3.139 Ofcom estimated the LRIC of line cards in 2012/13 to be in the range £11 to £13 (in 2012/13 prices). We noted that this figure was close to, but less than, the LRIC estimate of £14 based on line-card costs reported in 2004/05 RFS. We would expect the 2004/05 figure to be an overestimate since Ofcom said that depreciation did not reach a steady state until 2006/07[156] (when the LRIC was about £12), and because historic depreciation charges may have been overstated given the true asset life of the line cards.

[150] CPW W/S Houpis III, §50(f).
[151] CPW said that there had not been many new line cards since 1998 in WS Houpis III, §50.e.i.
[152] Figures from 2005/06 to 2008/09 are broadly constant in real terms (£12.30 compared with £14.89, £12.32, £11.41, £11.71 and £10.43 respectively).
[153] This assumed that by 2013 the roll-out of combi cards was to be largely complete.
[154] Ofcom Defence, Annex, §§65–69.
[155] Ofcom letter, 28 May 2010, p21.
[156] WLR Defence, Annex, §67.

(d) Has Ofcom failed to allocate sufficient product management costs to WLR as compared to MPF (and in particular, has Ofcom failed to apply the correct relative fault rates)?

Introduction

3.140 We noted that many of the arguments CPW made in relation to product management in the LLU and WLR NoAs were superseded by later submissions.[157] The only remaining issue concerned assumptions made on relative fault rates.

3.141 CPW argued that WLR should be allocated more of the product management and service costs than MPF because WLR was a more complex service and involved more product design, system design, number management, line features, network management, line testing, sales management and faults.[158] Part of the additional management cost CPW attached to WLR was due to the need to familiarize staff with the new systems due to the expected adoption of NGN.

3.142 CPW's initial estimates of the LRIC differentials for MPF vs WLR+SMPF were broadly in line with Ofcom's estimates (£4 for CPW, £3 to £4 for Ofcom). There was, however, a significant difference between Ofcom and CPW for MPF vs WLR (£1.50 for CPW and –£3 to –£1 for Ofcom).[159] Ofcom explained the difference, saying that some product costs were included in the line-card costs, MPF users had more diverse requirements with higher management costs than WLR, fault rates for WLR were lower than MPF based on a more representative sample, and there was a higher standard of care for MPF than for WLR.

3.143 CPW argued that product management LRIC differences should be assessed assuming that MPF was used to provide voice-only services.[160] CPW also claimed that Ofcom was using fault rate data for 2007/08 rather than data that predicted the situation in 2012/13.[161] Ofcom rejected the assertion that it was appropriate to consider the costs of MPF as a voice-only service because it was not provided or used on this basis and, furthermore, it might need additional monitoring for a voice-only MPF service to be made available at a lower price than MPF. Ofcom also considered that, in the absence of any expectation for the fault rates to change, it was reasonable to base forecasts on the latest actual fault rates.[162]

3.144 CPW raised some concerns with regard to product development and noted that the management costs appeared to have been allocated on the basis of revenue, such that the cost of SMPF was implausibly low (one-fifth of MPF).[163] Frontier's figures resulted in lower, not higher, overall charges for SMPF although the only adjustment made for product management was an adjustment to the assumed fault rate (and CPW said that there were high levels of transfer costs applied to SMPF).[164] CPW found that, overall, product management costs were relatively small and stated that it might be more appropriate to deal with them as a mark-up of common cost rather than apply a different arbitrary allocation mechanism.[165,166]

---

[157]See discussion of CPW W/S Heaney VII, §71.
[158]CPW W/S Heaney I, §§262–264.
[159]WLR Statement, pp5.73–5.83 and Figure 5.1.
[160]CPW W/S Heaney III, §§32 & 48.
[161]CPW W/S Heaney III, §42.
[162]Ofcom Defence, Annex, §§91 & 98.
[163]CPW W/S Heaney VII, §§62–67.
[164]CPW WLR bilateral hearing transcript, 30 April 2010, p21 (17–22).
[165]CPW WLR bilateral hearing transcript, 30 April 2010, pp107&108.
[166]CPW repeated the comment that SMPF had a small amount of product management and that this was a relatively small error in the letter of 26 May 2010. This was after seeing the actual product management costs and allocations for the first time, but without access to the CF model and calculation that Frontier used.

3.145 CPW stated that its proposed adjustment of MPF fault rates being 10 per cent lower, rather than 10 per cent higher, than WLR fault rates, which reflected more recent data, would increase both the LRIC price differences by £4.30.[167] We noted that this amount was almost as large as the maximum difference between CPW and Ofcom in LRIC differentials (£1.50 to –£3). CPW claimed that this large difference would occur if fault rate assumptions matched actual usage figures.

3.146 CPW assumed that Ofcom had based its fault rate figures on 2007/08 and had ignored more recent data, such as that from the Openreach presentation of 10 July 2009. This presentation showed that, for January–May 2009, there were slightly fewer than 2 MPF faults per thousand, compared with about 2 faults per thousand for WLR in April–May 2009. In June 2009, WLR had about 2.5 faults per thousand and MPF had about 2.2 faults per thousand (or about 10 per cent less).

3.147 CPW stated its letter of 27 April that it disagreed with Ofcom on fault repair and product management.[168] However, the Frontier report, supplied with that letter, stated explicitly that it did not include adjustments for these factors, and that it used MPF fault rates based on historic data and it had not made an adjustment for product management (however, by default, product management would be allocated via the mark-up).[169] CPW said that the Frontier model and assumptions superseded its previous estimates,[170] which rendered the status of CPW's remaining claim on fault rates uncertain.[171]

3.148 The Frontier model (see paragraph 3.13 to 3.15) used the same adjusted assumptions on fault rates which Ofcom used, namely that MPF would have 10 per cent more faults than WLR. However, it also included a sensitivity test for equal fault rates which could be used to estimate the effects of CPW's view that MPF would have 10 per cent *fewer* faults than WLR.[172,173]

3.149 Using an updated version of the Frontier model, provided to us on 1 June, we derived an estimate of the effects on the LRIC differentials of moving from 10 per cent more faults for MPF to 10 per cent fewer faults. For WLR vs MPF the effect of this on the LRIC differential was £[✂] and for WLR+SMPF vs MPF it was –£[✂].[174]

3.150 Ofcom provided a table of the breakdown of CCA FAC product management, servicing and other costs. This submission showed that fault rates were the major constituent of these costs and they were the primary reason for differences in the product management costs of WLR and MPF. Fault-related costs were £[✂] less for WLR than for MPF (not including the full effect of service level agreements).[175] Ofcom attributed this difference to a greater prevalence of faults on MPF lines due to broadband services being more sensitive to faults than voice. Ofcom said that accepting CPW's arguments would require the actual experience of BT to be disregarded.

[167] CPW W/S Heaney VII, §71.
[168] CPW letter, 27 April 2010, p3, 4th & 5th bullets.
[169] Frontier report, 27 April 2010, p18.
[170] See CPW W/S Heaney I, Fig 18.
[171] CPW bilateral hearing transcript, 30 April 2010, p87.
[172] Frontier report, 27 April 2010, §2.3.
[173] To do this, we looked at the 'equal fault rates' sensitivity and doubled the effect.
[174] Although the fault rate assumption reduces the MPF charge and increases the WLR, it also reduces the SMPF and so the WLR+SMPF vs MPF LRIC differential increases significantly.
[175] Ofcom letter, 28 May, Annexes 1 & 2. A service level agreement outlines the applicable time limits for Openreach to fix certain faults reported by a CP or a consumer. The parties disagreed about the extent to which a difference in service level agreement commitments would cause a difference in fault costs or whether the cost of faults would be mainly determined by the number of faults and the work involved to fix a fault. If this estimate had agreed with the Frontier calculations it should be equal to half the LRIC differentials quoted.

Assessment

3.151 We do not consider that Ofcom erred in its assumption as to the relative fault rates of WLR and MPF.

3.152 We noted that the issue of fault rate differences accounted for the vast majority of the difference between Ofcom and CPW that was initially described as product management.[176]

3.153 CPW had identified that product management differences were small and that a fault rate adjustment on its own resulted in a LRIC differential approximately equal to the full adjustment expected for product management. This suggests that any product management issues other than fault rates are too small to affect the LRIC calculation.

3.154 CPW claimed that Ofcom had used 2007/08 data and ignored recent evidence. CPW referred to a presentation by Openreach from 10 July 2009 which showed that MPF faults in early 2009 (especially June) were 10 per cent lower for MPF than WLR. Ofcom did not state to what period the fault rate data it presented related.[177]

3.155 Ofcom stated that the fault rate evidence used by CPW did not appear to be representative of lines as a whole. This evidence covered only a short period, and related only to lines which CPW bought from Openreach and not the lines of other CPs. We do not consider that Ofcom is expected continually to update all its information when determining a price control. Ofcom had gathered a large sample of data on relative fault rates and the smaller CPW sample was not consistent with this. There was some uncertainty in CPW's estimation of fault rate and product management effects and the estimates were absent from the Frontier base case. However, using the Frontier model with CPW's fault rate assumptions would suggest that the WLR vs MPF LRIC differential could be underestimated by about £[✂] and the WLR+SMPF vs MPF differential overestimated by £[✂].

3.156 We do not consider that the fault rate data provided by CPW demonstrates that Ofcom erred in not using more up-to-date fault rate information and not revising the relative fault rate assumption used. Even if the data favoured by CPW was adopted, we do not consider that it would show that the product management assumptions used by Ofcom had caused a material error in the calculation of charges. The impact of the LRIC adjustment would be too small to call into doubt Ofcom's cross-check assessment for the WLR+SMPF v MPF differential.[178]

3.157 In its response to the provisional determination CPW accepted that there was not a material error in the treatment of product management (excluding fault rates), ie the only remaining issue under this heading was the assumptions on fault rates. CPW said that if the FAC differential for MPF v WLR were estimated using more reliable information on fault rates, this would increase by £4.30 in 2012/13. CPW said that the LRIC differential would be less than this. We note that this estimate[179] was not given the prominence in the submissions that CPW is now giving it. The submission did not explain whether this estimate was an FAC or a LRIC.

---

[176] See CPW W/S Heaney I.
[177] Ofcom letter, 28 May 2010, Annexes 1 & 2.
[178] If Ofcom's estimate of the LRIC differential (£15–£20) was increased by the full £4.30 the new LRIC estimate would be £19–£24, which is still below the differential in charges of £25.53. The effect of this adjustment would be lower if the £4.30 (FAC) was an overestimate for the LRIC, or if the correct LRIC adjustment was closer to the estimate in the Frontier model of £[✂]. We agree with Ofcom that in considering whether the differential between charges is in line with LRIC, the more important differential is that between MPF v WLR+SMPF. This is the only aspect of the LRIC differential where we have considered the implication of a change to Ofcom's assumptions.
[179] See W/S Heaney VII §71(b).

3.158 CPW also questioned the use of the LRIC estimate of –£[✄] for WLR+SMPF LRIC. We note that the use of a zero fault rate for SMPF is Frontier's assumption and not ours. This is contained in the Frontier model and report. This assumption is applied by Frontier for the purpose of demonstrating the effect of assuming equal fault rates on the SMPF charge and, as explained, gives a low estimate for proposed SMPF charge (Table 7 of the report). Ignoring this estimate for SMPF gives an estimate from the Frontier model of adopting the CPW assumption on fault rates of £[✄], which is still significantly below the estimate provided by Mr Heaney.

Has Ofcom erred in setting prices on a CCA FAC basis?

Introduction

3.159 Ofcom and BT argued that CCA FAC approach had the benefits of being widely understood and recognized and that the input data was capable of being reconciled to regulatory accounts.[180] CPW disputed this.

3.160 Ofcom said that it expressly recognized that, despite these advantages, CCA FAC may not necessarily lead to the most efficient outcome. It therefore considered whether there were strong objections to CCA FAC on efficiency grounds for the particular wholesale charges being considered. An important aspect of assessing this was to consider the differentials between the wholesale charges. Ofcom recognized the importance of the differentials, and particularly the MPF vs WLR+SMPF differential.[181]

Assessment

3.161 We do not consider that Ofcom erred in adopting its CCA FAC approach.

3.162 The choice between the different methods of determining price controls is a difficult judgement. In this case, Ofcom associated its CCA FAC approach with its cross-check of the resulting differentials against estimates of the LRIC differentials for MPF vs WLR and, more importantly, MPF vs WLR+SMPF. CPW's arguments in relation to the calculation of the LRIC questioned the validity of the cross-check, but did not in themselves undermine the CAA FAC approach.

Determination

3.163 Our determination in response to Question 1 is as follows. For the reasons given above (3.37 to 3.51, 3.55 to 3.65, 3.75 to 3.84, 3.96 to 3.110, 3.120 to 3.127, 3.137 to 3.139, 3.151 to 3.158 and 3.161 to 3.162), we do not consider that the WLR price controls have been set at a level which is inappropriate because Ofcom failed to set the controls in such a way as to secure that the differential between, on the one hand, the price for WLR and/or WLR+SMPF and, on the other hand, MPF was at least equivalent to the LRIC between those services:

(a) by reason of Ofcom setting the price differentials on a CCA FAC basis rather than on a LRIC basis, as claimed by CPW in particular in §§87 and 88 of the WLR NoA; or

[180] BT WS Esslin-Peard II, §§10–22.
[181] Ofcom WLR Defence, Annex, §5.

(b) by reason of Ofcom having erred in its calculation of LRIC as claimed by CPW in §§92–105 of the WLR NoA.

Part 2: Reference Question 2

3.164 This part sets out our determination as to whether Ofcom erred in setting the level of WLR price controls because Ofcom should have, but did not, set those controls so that the price differentials were greater than the difference between the LRICs for MPF vs WLR and MPF vs WLR+SMPF, as claimed by CPW in §§76–107 of the WLR NoA.

3.165 For the reasons given below in paragraphs 3.176 to 3.179, 3.190 to 3.199, 3.206 to 3.209, 3.214 to 3.228, 3.237 to 3.252 and 3.265 to 3.276, our determination is that Ofcom has not erred in setting the level of WLR Price Controls as claimed by CPW in §§76–107 of the WLR NoA.

Reference Question to answer

3.166 Reference Question 2 asks:

> Whether, for reasons set out within paragraphs 76 to 107 of the Notice of Appeal, the WLR Price Controls have been set at a level which is inappropriate because OFCOM should have, but did not, set those controls in such a way as to secure that the differential between on the one hand, the price for WLR and/or WLR + SMPF and, on the other hand, MPF was *greater than* the difference between the LRIC of those services.

Assessment

Introduction

3.167 CPW and Ofcom agreed that productive efficiency considerations alone would require that the differences between charges for MPF vs WLR+SMPF[182] should be set to reflect the difference in the LRICs of providing these services.[183]

3.168 CPW said that Ofcom had erred in setting the WLR price controls because Ofcom had failed to take sufficient account of allocative and dynamic efficiency considerations. In particular, CPW argued that, in deciding to set the price difference in line with CCA FAC, Ofcom had effectively made minimal and inappropriate allowance for allocative and dynamic efficiency considerations.[184] CPW said that, in its view, allocative and dynamic efficiency were as important as, if not more important than, productive efficiency. CPW said that the potential impact from productive efficiency distortion was small.[185] CPW claimed that if Ofcom had taken sufficient account of allocative and dynamic efficiency, the price control should have been set in such a way that the differential between, on the one hand, the price for WLR and/or WLR and SMPF, and on the other hand, MPF was the difference between the LRIC+EPMU of these services.

3.169 CPW said that, whilst a precise calculation of the most economically efficient structure of charges was challenging, a price differential based on LRIC+EPMU was likely to be a good approximation in practice to an economically efficient price differ-

[182]Ofcom's position in relation to MPF vs WLR was that productive inefficiencies were unlikely to arise from the differential not being aligned to costs (WLR Statement §5.16).
[183]CPW LLU NoA, §§96–98, and Ofcom LLU Defence, Annex D, §3.
[184]CPW W/S Houpis I, §11d.
[185]CPW WLR bilateral hearing transcript, 30 April 2010, p24, lines 1–8.

ential.[186] CPW also said that this approach represented an appropriate and pragmatic balance between the different efficiency considerations, and it would address Ofcom's concerns of productive inefficiencies arising from a LRIC+EPMU approach by minimizing this risk.[187]

3.170 We have been asked to determine whether for the reasons given by CPW in the NoA, Ofcom set the WLR price controls at an inappropriate level because the differential should have been greater than the LRIC of those services. As set out in paragraphs 3.168 and 3.169, CPW specifically claimed that Ofcom should have set the cost differences at LRIC plus EPMU. Our view of CPW's case is based on what CPW told us. We asked CPW to confirm the issues in contention and, if the CC were to accept CPW's arguments, how CPW was proposing that revised charges for MPF, SMPF and WLR rental services should be calculated.[188] In a letter from CPW to the CC, dated 27th April 2010, CPW told us that: the cost difference should be based on using a LRIC+EPMU methodology; the correct approach was to calculate first the LRIC costs and cost differences and then to recover fixed and common costs by applying appropriate mark-ups calculated on an EPMU basis; and a price differential based on the LRIC+EPMU cost difference was likely to be a good approximation to economically efficient price differential. We have therefore considered whether Ofcom set the price control at an inappropriate level, because, as CPW has reasoned, the level that should have been set should have ensured a differential of LRIC plus EPMU.

3.171 CPW also said that the only risk associated with its approach would be stronger MPF-based competition than would otherwise be the case.[189]

3.172 CPW argued that MPF-based competition (also referred to as network-based competition[190]) had substantial benefits for consumers in terms of choice and quality of service. It exposed a wider range and amount of cost to competition, driving down retail prices. CPW also claimed that it was an Ofcom policy objective to promote network-based competition.[191] CPW said that, in the longer term, if Ofcom was able to act as a central planner, it was CPW's understanding that Ofcom would choose MPF.[192]

3.173 CPW submitted a set of revised charges calculated by Frontier that applied the approach CPW said should have been taken by Ofcom.[193] Table 3.2 shows the cost benchmarks for 2012/13 used by Ofcom to set the price controls for MPF, SMPF and WLR, and CPW's revised calculations. These figures show that CPW was arguing for lower MPF and SMPF charges and higher WLR charges, resulting in an increase in the differential between MPF and WLR from £10 to £36 per line and between MPF and WLR+SMPF from £25 to £47 per line.

[186]CPW letter to the CC, dated 27 April 2010.
[187]CPW letter to the CC, 25 May 2010, §7.
[188]CC letter to CPW, dated 19 April 2010.
[189]CPW WLR bilateral hearing transcript, 30 April 2010, pp22&23, lines 30 to 20.
[190]CPW recognized that both SMPF- and MPF-based competition were network-based.
[191]CPW LLU NoA, §93.
[192]CPW WLR bilateral hearing transcript, 30 April 2010, p23, lines 14–17.
[193]See Section 3: Part 1, footnote 21 for further information concerning the information submitted by Frontier.

TABLE 3.2 **Ofcom’s price controls and CPW’s revised figure (base method) for 2012/13***

	Ofcom CCA FAC	*CPW*	*LRIC+ EPMU*
WLR—Residential	108	[✂]	
LRIC			[✂]
Cost category mark-up			[✂]
EPMU			[✂]
WLR—Business	104	[✂]	
LRIC			[✂]
Cost category mark-up			[✂]
EPMU			[✂]
MPF	98	[✂]	
LRIC			[✂]
Cost category mark-up			[✂]
EPMU			[✂]
SMPF	15	[✂]	
LRIC			[✂]
EPMU			[✂]

Source: LLU and WLR Statements, CPW letter dated 1 June 2010, and enclosed excel model.

*These results are the Frontier base case to the nearest whole pound sterling. The cost category mark-up for SMPF is 0.1.

3.174 Table 3.2 shows the three elements that make up the price control following CPW’s methodology, being:

(a) the estimated LRICs for each product;

(b) the allocation of common costs for certain cost categories, including duct and cable costs, between MPF and WLR lines in proportion to the estimated incremental costs for the relevant cost category;[194] and

(c) an EPMU on the estimated LRIC for each product so that total costs allocated to CRS services are fully recovered.[195,196]

3.175 Table 3.2 shows that CPW’s approach would result in a substantial increase in the differential between charges. In particular, the differential between charges for MPF vs WLR+SMPF in 2012/13 would, if it were to reflect only CPW’s estimates of the LRICs, be £[✂] greater than that using Ofcom’s CCA FAC approach, but £[✂] greater if it were to also reflect an EPMU mark-up.[197]

Assessment

3.176 We do not consider that Ofcom erred by setting price controls that did not secure a difference between on the one hand the price of WLR and/or WLR+SMPF and, on the other hand, MPF that was consistent with LRIC+EPMU. We do not consider that in setting prices, Ofcom erred by adopting an approach that took greater account of productive efficiency considerations than allocative or dynamic efficiency considerations. We were not persuaded by CPW’s arguments that Ofcom should have set

[194]Frontier report, April 2010, p8. Frontier referred to this as an application of the EPMU methodology on a cost category by cost category basis, but it resulted in replicating Ofcom’s FAC numbers for duct and cable.
[195]The table shows that with CPW’s approach the two elements of the EPMU mark-up accounted for a large proportion of the charge. In particular, if we consider the total costs allocated to CRS services in 2012/13, the estimated LRICs account for about 49 per cent of this cost; a further 27 per cent by the EPMU applied on a cost category by cost category basis; and 24 per cent by the EPMU applied to the estimated LRIC at a product level.
[196]Frontier also estimated charges applying an alternative method where in the final step the EPMU mark-up was applied to the sum of the estimated LRICs for each product and the common costs allocated on an individual cost category basis. This had the effect of reducing the MPF vs WLR differential from £36 to £33 in 2012/13.
[197]Using the results for WLR residential.

prices that maximized allocative and productive efficiency[198] or that a price differential based on CPW's LRIC+EPMU methodology would be a good approximation to an economically efficient price differential.[199] We reach this conclusion for the following reasons.

3.177 First, we were not persuaded by CPW's arguments that setting a price differential to be equal to LRIC would result in allocative inefficiency for the following reasons:

(a) We consider that CPW's attempt to draw a direct relationship between the wholesale demand for MPF lines and the retail demand for broadband services, and between the wholesale demand for WLR lines and the retail demand for voice services, was overly simplistic.

(b) We do not accept CPW's arguments made specifically in relation to Ofcom's views of the relative importance of the differential between the charges for MPF and WLR and, in particular, that the price differential should be set so that MPF-based providers are able to compete in the supply of voice-only services.

(c) We agree with Ofcom that there would be serious practical limitations to attempting to reflect allocative efficiency considerations in setting charges.

3.178 Second, we did not consider that CPW had demonstrated that LRIC+EPMU would achieve an appropriate balance between the various efficiency considerations. In particular, we considered that there was a danger that this approach could result in inefficient investment in MPF and a distortion of competition to the disadvantage of consumers. CPW's position was that dynamic efficiency required that CPs were incentivized to use MPF which would tend to encourage stronger and deeper long-term competition with its associated benefits for consumers.[200] We were not persuaded by this.

3.179 We consider each of these points in turn below. For each point, we set out briefly the key arguments made by the parties and then our assessment of these arguments.

Charges for MPF and WLR lines should reflect the characteristics of demand for broadband and voice services

Arguments

3.180 CPW argued that if prices of MPF and WLR were set to reflect no more than the absolute difference in the incremental costs of MPF and WLR, this would unambiguously lead to allocative inefficiencies.[201] CPW claimed that this was the approach Ofcom had adopted.

3.181 CPW argued that allocative efficiency would require the recovery of fixed and common costs to take into account the different demand characteristics of voice and broadband services. CPW said that if it were simply assumed that the (super-) elasticities[202] of the various services were all equal, the pricing differential should be consistent with a LRIC+EPMU approach to setting charges.

---

[198]CPW W/S Houpis I, §51.
[199]CPW letter to the CC, 27 April 2010, p2.
[200]CPW WLR NoA, §82.2.
[201]CPW W/S Houpis I, §61.
[202]A 'super-elasticity' measures the effect on the demand for a good of small changes in the prices of all goods in the market. It is a function of the service's own- and cross-price elasticities, including a weighting for relative revenue shares.

3.182 CPW said that it had provided evidence to Ofcom in response to Ofcom's Second Consultation that showed that the demand for voice services was relatively more inelastic than the demand for broadband services. CPW said that this evidence suggested that an efficient set of prices should recover more fixed and common costs from voice services.[203]

3.183 CPW said that Ofcom seemed to have recognized this point when Ofcom stated in its Second Consultation document:[204]

> We think it is likely that currently demand for MPF is driven more by broadband than voice, and that demand for broadband is likely to be more price sensitive than voice. On its own, this might suggest that it would be more efficient to set a slightly lower mark-up on marginal costs for MPF than for WLR.[205]

3.184 CPW acknowledged that the conditions under which the derived demand elasticities for MPF and WLR would be reflective of the price sensitivities at the retail level were restrictive.[206] Nevertheless, CPW concluded that this relativity in price elasticities of demand for retail voice and broadband services was likely to be reflected in the price elasticities of demand for MPF and WLR, with demand for MPF being relatively more elastic than demand for WLR (as demand for MPF was predominantly driven by demand for broadband, whereas demand for WLR was still driven by demand for voice services). In particular, CPW said that it had not seen and had not been made aware of any evidence to suggest that a more realistic set of conditions would reverse the evidence on the relative price sensitivities of the demand for broadband and voice services at the retail level.[207]

3.185 CPW also acknowledged that the potential for MPF to be used to provide voice-only services reduced the weight which should be attributed to allocative efficiency. However, CPW stated that, over the relevant time horizon, the demand for MPF was likely to be driven primarily by the retail demand for voice and broadband services delivered together, and hence allocative efficiency considerations remained relevant.[208]

3.186 Ofcom said that Ramsey pricing principles (see paragraph 3.188 below) that CPW argued should be applied were relevant where there was a correspondence between retail outputs and the wholesale inputs which supported them and where, as a result, it was possible to set wholesale prices to induce an efficient set of Ramsey prices at the retail level. Ofcom said that there was no such correspondence in this case, with the same outputs being supplied using different combinations of inputs.[209] Ofcom said that MPF was used currently exclusively for the combined delivery of voice and broadband. MPF and WLR+SMPF were therefore currently alternative wholesale inputs for the same retail products.[210] When two inputs were substitutes, the theory implied that their relative prices should be set to reflect their relative marginal costs.[211]

[203] CPW W/S Houpis I, §56.
[204] CPW W/S Houpis I, §57.
[205] Ofcom, Second Consultation, §6.36.
[206] CPW W/S Houpis I, §59.
[207] CPW W/S Houpis I, §59(b).
[208] CPW letter to the CC, 27 April 2010, p2.
[209] Ofcom WLR bilateral hearing transcript, 6 May 2010, p6, lines 3–6.
[210] Ofcom LLU Defence, Annex D, §9.
[211] Ofcom LLU Defence, Annex D, §17.

3.187 Ofcom said that its objective was, therefore, not to set wholesale prices so as to induce Ramsey retail prices, but to produce a given set of outputs at minimum cost.[212]

3.188 Ofcom recognized that the theory of Ramsey pricing could be applied to products which were substitutes using the 'super-elasticity' of demand for the product.[213] However, Ofcom suggested that these elasticities should not reflect a delay in responding to price signals due to switching costs. Ofcom said that as the obstacles to switching would be likely to disappear over time, the expected long-run elasticity of substitution would be significantly higher than the short-run elasticity and that, over time, this would have to be reflected in changes in optimum prices. Ofcom also said that it would be difficult to track the changes in the elasticity over time and to adjust prices accordingly.[214]

3.189 Ofcom also said that, absent a stable relationship between the price differentials and the degree of technical substitution between MPF and WLR+SMPF, implementation of CPW's approach would be likely to be unsuccessful because of unstable and unintended switching away from WLR lines.[215]

Assessment

3.190 We were not persuaded by CPW's arguments that the relative elasticities of retail demand for voice and broadband services should be reflected in charges for MPF and WLR line rental. Our reasons are set out below.

3.191 We understood that the economic principle underlying CPW's argument was that users of voice services, whose demand was more inelastic than the demand for broadband services, should make a greater contribution to the recovery of fixed and common costs associated with the provision of access network services. This was because such a contribution would minimize the welfare loss arising from having to charge prices for MPF, SMPF and WLR that were higher than their LRICs.

3.192 CPW sought to establish a relationship between the relative price elasticities of retail demand for voice and broadband services and the relative price elasticities of wholesale demand for MPF and WLR by arguing that wholesale demand for MPF was likely to be driven primarily by retail demand for broadband services, while demand for WLR was driven primarily by demand for voice services.

3.193 We did not, however, accept that a direct relationship could be drawn between the retail demand for broadband services and wholesale demand for MPF lines and between the retail demand for voice services and wholesale demand for WLR lines, for the following reasons:

(a) Currently, MPF lines are used largely to provide packaged voice and broadband services. We noted that the Ofcom statement to which CPW pointed in support of its case said that 'currently, demand for MPF is driven *more* by broadband than voice', and not '*primarily*' by demand for broadband (see paragraph 3.183 above).

(b) Currently, over half of the 21 million WLR lines are used in conjunction with SMPF to provide voice and broadband services either by the same or different

---

[212]Ofcom WLR bilateral hearing transcript, 6 May 2010, p52, lines 10–22.
[213]Ofcom LLU Defence, Annex D, §10.
[214]Ofcom LLU Defence, Annex D, §21.
[215]Ofcom LLU Defence, Annex D, §22.

providers. SMPF services can only be used in conjunction with WLR lines. Therefore, the retail demand for broadband services will also be a factor in the demand for WLR lines.

3.194 Nevertheless, we accept that if, as CPW and Ofcom seemed to agree, the retail demand for broadband services was more price elastic than the retail demand for voice services, the demand for MPF lines overall might be more elastic than that for WLR lines. This is because wholesale demand for WLR lines is an aggregation of demand for lines to provide voice-only services and, in conjunction with SMPF, to provide voice and broadband services.

3.195 CPW's approach of setting price controls based on LRIC+EPMU would result in customers taking voice and broadband services based on WLR+SMPF making a greater contribution to fixed and common costs than a customer being provided with the same services but using an MPF line. This is because the price control for WLR lines, whether used on its own to provide a voice-only service, or in conjunction with SMPF to provide a voice and broadband service, would reflect the lower elasticity of demand for voice services compared with that for broadband, or broadband and voice, services.

3.196 In making its case, CPW focused on the appropriate differential between charges for MPF and WLR.[216] It was on this basis that CPW argued that Ofcom's approach unambiguously resulted in allocatively inefficient charges. CPW acknowledged, however, the wider implications of its approach.[217]

3.197 CPW said that in a hypothetical scenario in which no SMPF product existed such that voice and broadband service could only be provided using MPF, then the two inputs WLR and MPF would be used to provide different retail outputs. CPW said that, in practice, as operators could also use SMPF in combination with WLR to offer voice + broadband services, and SMPF allowed operators to offer broadband services to customers that already purchased voice services, setting a price differential between MPF and WLR that was above LRIC would also lead to a price differential between MPF and WLR+SMPF that is above LRIC. CPW considered that this would not undermine the feasibility of setting a price differential between MPF and WLR. The reason for this seemed to be CPW's views on the extent to which MPF and WLR+SMPF were technical substitutes. For the reasons given below (see paragraphs 3.206 to 3.209), we do not accept CPW's arguments that the choices between MPF and WLR+SMPF would not be sensitive to changes in the relative prices of these services.

3.198 We consider that the effect of CPW's approach would be that a significant number of final customers who are receiving voice and broadband service but via different platforms would make different contributions to the recovery of fixed and common costs. We do not consider that this approach would be consistent with a view that the price differentials between different inputs to the delivery of voice and broadband services should reflect the differences in the characteristics of demand for the services delivered using these inputs or of the derived demand for the inputs.

3.199 Ofcom made the point that CPW's approach would not be expected to result in efficient Ramsey prices in the retail market. Our understanding of this is that it would not result simply in end-customers, when using voice services, making a higher contribution to the recovery of common network costs than those end-customers using broadband services.

[216]CPW W/S Houpis I, §§55–62.
[217]CPW letter to the CC, 25 May 2010.

Relative importance of the differential for MPF v WLR

Arguments

3.200 CPW's arguments that greater account should have been taken of allocative efficiency considerations focused on what CPW considered to be the appropriate basis for determining the differential between charges for MPF vs WLR (rather than WLR+SMPF).[218] Ofcom considered that the differential between MPF and WLR charges would be an important consideration if the size of the differential appeared likely to create significant productive inefficiencies. Ofcom said that, in practice, it was unlikely that any productive inefficiency would occur if the difference in the charges for WLR and MPF did not reflect LRIC because it was not clear that it would be economic for an MPF operator to provide voice-only services given the economies of scale involved relative to the value of the service.[219]

3.201 CPW said that Ofcom was wrong to suggest that productive efficiency considerations were less relevant when comparing the costs of WLR and MPF because the economies of scale present in using MPF would make it commercially unattractive to offer only voice-only services using MPF. CPW said that this ignored the significant economies of scope between using MPF to deliver both broadband and voice, and MPF to deliver voice-only services, to customers in exchanges that had been unbundled. As a result, an operator such as CPW, which currently offered both voice and broadband, would not be disadvantaged by scale economies if it chose to use MPF to deliver voice-only services in the areas where it operated.[220]

3.202 CPW also said that it had formally requested a product variation that would allow it to use MPF to offer voice-only services. CPW had been considering launching a voice-only retail (and possibly a wholesale) service based on using MPF, but this had not been viable for two reasons. First, the price difference between MPF and WLR was insufficient and, second, an MPF product variant that would allow customers to take a voice-only service from CPW and take SMPF from another provider was not available.[221]

3.203 Ofcom said that if there were demand for MPF for voice-only services, productive efficiency considerations would be more important than any allocative efficiency considerations, for the same reasons as for the differential between the price of MPF and the price of WLR+SMPF.

3.204 Ofcom agreed that there were economies of scope in the provision of voice-only and voice + broadband services, but said that there remained good reasons for thinking that demand for using MPF for voice-only services was unlikely with a differential between MPF and WLR that was broadly equivalent to the LRIC differential between those services.

3.205 Ofcom accepted that if there was a very wide differential between MPF and WLR, there could be demand for MPF as a voice-only product, but considered that a differential greater than that provided for in the WLR Statement would be inefficient and against consumers' interests because it could encourage CPs to use MPF to deliver voice services when this would have higher total costs to society than if CPs used WLR.

---

[218] See CPW W/S Houpis I §§51–65.
[219] WLR Statement, §5.16.
[220] CPW W/S Houpis III, §13 onwards.
[221] CPW W/S Heaney III, §§50–52.

Assessment

3.206 We do not accept the arguments CPW made specifically in relation to Ofcom's statements on the importance of the differential in prices between charges for MPF and WLR. In particular, we consider that the arguments raised by CPW were not clear and had a number of inconsistencies. On the one hand, CPW argued on allocative efficiency grounds for a larger differential between charges for MPF and WLR based on the relative elasticities of demand for voice (which it equated with WLR), and voice and broadband services (which it equated with MPF). On the other hand, CPW's argument that MPF was potentially a competitive means of providing voice-only services and that the price differential should be set so that MPF-based CPs would be able to compete in the provision of voice-only services[222] is in our view inconsistent with its allocative efficiency arguments. CPW recognized that the potential for MPF to be used to provide voice-only services reduced the weight which should be attributed to allocative efficiency.[223] In its response to the provisional determination, CPW disagreed with our view. It said that it had not been inconsistent. CPW said that these two propositions were not incompatible and they reflected that MPF could play two roles in both providing broadband and voice services as well as voice-only services. Whilst we accept that MPF can play two roles, in our view, CPW's response has not sufficiently addressed our points set out in paragraphs 3.190 to 3.199 and as such we see no reason to change our view.

3.207 In relation to the potential demand for MPF lines to provide voice-only services, we noted that currently no MPF lines are being used to deliver voice-only services. Given Ofcom's conclusions that the differential between charges for MPF and WLR was broadly in line with costs,[224] we were satisfied that this lack of demand was a consequence of a pricing structure that broadly reflected the relative costs of providing these services. In its response to the provisional determination, CPW told us that the current lack of demand was artificially suppressed by insufficient price difference due to incorrect assumptions having been used in deriving the price difference. It gave as examples assuming an incorrect fault rate and no single jumpering for MPF. Our view on the examples provided by CPW is set out in paragraphs 3.151 to 3.158 and 3.120 to 3.127—in short, we do not agree with CPW.

3.208 We also found that both parties agreed that whether MPF was, or was not, a commercially viable means of delivering voice-only services would depend on the relative price of MPF and WLR lines (see paragraphs 3.202 and 3.205 above). We considered, in the context of determining the appropriate structure for MPF, SMPF and WLR charges, the argument as to whether MPF and WLR were, or were not, substitutes, was a circular one because the answer would be dependent on the relative price.

3.209 We also agreed with Ofcom that to set prices simply so that CPs would be able to compete using MPF in delivering voice-only services with CPs using WLR lines could encourage inefficient use of MPF lines if the price differential was not aligned to costs (see paragraph 3.222).

[222]CPW W/S Houpis III §§15–19.
[223]CPW letter to the CC of 27 April 2010.
[224]WLR Statement, §5.87.

Practical limitations associated with attempting to reflect allocative efficiency considerations

Arguments

3.210 Ofcom said that whilst, in theory, it could have sought to optimize economic efficiency, giving some weight to allocative efficiency in setting the differentials, there were, in practice, severe measurement difficulties. Ofcom concluded that it was not feasible to try to optimize economic efficiency in a very precise way.[225]

3.211 CPW agreed with Ofcom that determining an optimal set of Ramsey prices posed significant practical challenges and stressed that it was not arguing for the implementation of optimal Ramsey prices.[226] However, CPW said that the evidence of significantly different demand characteristics for voice and broadband services demonstrated the importance of choosing a structure of prices that went some way towards reflecting efficiency, rather than basing prices on an unadjusted application of CCA FAC.[227]

3.212 Ofcom took the view that, in this price control, the best that could realistically be achieved in terms of economic efficiency was to ensure that the differentials between MPF vs WLR and MPF vs WLR+SMPF reflected sufficiently its estimate of the likely range for LRICs.[228]

3.213 Ofcom said that another problem with attempting to set optimal prices for MPF, WLR and SMPF was that the analysis could only be partial as Ofcom had not set other prices in this way. Ofcom gave as an example the retail provision of calls which shared some common costs with access products. Ofcom said that calls generally had a higher elasticity than access products, so mark-ups on access products would have to reflect the lower elasticity of access prices compared with call prices. This could require a recalculation of the common cost allocation in the Network Charge Control in order to reduce mark-ups on calls.[229]

Assessment

3.214 We agree with Ofcom that to determine a set of prices that would reflect different efficiency considerations would be practically difficult. We do not accept CPW's case that allocative efficiency considerations could be reasonably reflected by adopting a LRIC+EPMU approach. In particular, we do not accept the assumptions that underpin CPW's case and therefore agree with Ofcom that there are practical information limitations to implementing Ramsey pricing, even if only very approximately.[230] Our reasons are as follows.

3.215 We acknowledge that CPW did not argue for full implementation of Ramsey pricing, as it recognized that robust estimates of the relevant price elasticities could not be established readily. Nevertheless CPW argued for the principles of Ramsey pricing to be reflected in the structure of prices. In particular, CPW argued that the products or services for which demand was more inelastic should make a larger contribution to the recovery of common and fixed costs. We consider that CPW's case for this approach depends on two arguments: first, evidence that retail demand for voice

[225] Ofcom LLU Defence, Annex D, §§24 & 25.
[226] CPW W/S Houpis I, §60.
[227] CPW W/S Houpis I, §60.
[228] Ofcom LLU Defence, Annex D, §28.
[229] Ofcom LLU Defence, Annex D, §27.
[230] CPW letter to the CC, 25 May 2010.

services was less elastic than that for broadband services and that this would be reflected in the demand for MPF and WLR lines; and second, that Ofcom overstated the degree of technical substitution between MPF and WLR+SMPF as a platform for delivering voice and broadband services.

3.216 The first of these arguments was required in order to advance the argument that allocative efficiency would require a differential between charges that was greater than LRIC+EPMU. CPW said that it had provided evidence during the Second Consultation on relative elasticities in relation to the demand for voice and broadband services. Ofcom accepted that the demand for voice services was probably more inelastic than that for broadband services. For the reasons given above (see paragraphs 3.190 to 3.199), however, we do not accept CPW's conclusions on what these would imply for the relative own-price elasticities of demand for MPF, SMPF and WLR products. In particular, we do not accept that it is correct to relate demand for MPF lines to the retail demand for broadband services and demand for WLR lines to the demand for voice services in the way that CPW does.

3.217 The second of these arguments was required in order to deal with the weight that should be attached to the various efficiency considerations. In particular, it was required to respond to Ofcom's arguments that substitution between WLR+SMPF and MPF would undermine efforts to charge higher prices for WLR lines and that CPW's proposals would result in inefficient investment in MPF.

3.218 Ofcom's view was that productive efficiency considerations were the most important of the various efficiency considerations given the risks that a differential that was wider than costs could result in inefficient investment in MPF.

3.219 CPW accepted that whether CPs would switch between WLR+SMPF and MPF products in response to price changes was a relevant consideration. In particular, in response to Ofcom's claim that where two wholesale products were substitutes there were limitations in the applicability of Ramsey pricing to derive an efficient set of charges, CPW said that Ramsey pricing could be applied in these circumstances using super elasticities of demand:[231]

> Ramsey pricing should therefore, in principle, and if correctly calculated, take into account cross price elasticities by incorporating these within what is known as the super-elasticity of the product. In this way substitution between two or more products as relative price level change is incorporated within the welfare analysis.

3.220 However, CPW argued that, in practice, given sunk costs and switching costs, changes in the relative prices of WLR, SMPF and MPF services were unlikely to result in CPs switching platforms for delivery of voice and broadband services. CPW also said that the potential for productive inefficiency arising from prices not being aligned with LRIC was small.[232] Ofcom argued that, although there might be short-term obstacles to CPs switching between MPF and WLR+SMPF, the cross-price elasticities would increase with the length of time over which they were considered.[233]

3.221 The arguments as to whether CPs would switch to MPF in response to higher prices for WLR are considered in more detail below, when we consider the potential for CPW's proposals to result in inefficient investment in MPF delivery (see paragraphs

---

[231] CPW W/S Houpis I, §54.
[232] Frontier Report, April 2010, p6, and CPW WLR bilateral hearing transcript, 30 April 2010, p24, line 4.
[233] Ofcom LLU Defence, Annex D, §21.

3.210 to 3.252). In summary, we agree with Ofcom that CPW has put too much weight on short-term obstacles to switching. Also, evidence provided suggested that the relevant question is not only whether CPs would, in response to an increase in the differential between charges for MPF and WLR+SMPF, switch to MPF, but also the impact that this would have on the rate at which a CP might move towards MPF-based delivery or the geographic scope of this switch to MPF. Sky said that the relative prices would, at the margin, be a factor in CPs' decisions on investment in MPF-based provision. We do not, therefore, accept CPW's argument that changes in the relative prices of MPF and WLR+SMPF products are unlikely to affect the existing rate of switching by CPs from WLR+SMPF to MPF-based delivery of voice and broadband services.

3.222 We agree with Ofcom that, in the circumstances that Ofcom was correct in not using LRIC plus EMPU. CPW accepted that on the information available it was extremely difficult to determine the welfare-maximizing price structure. This compares with the real risks that a price differential that is wider than justified by costs could result in inefficient investment in MPF and, as a result, higher costs incurred in the provision of access services. In its response to the provisional determination, CPW said that it appeared that our view was that it would be incorrect to give no weight to allocative and dynamic efficiency considerations. We are required to determine whether Ofcom erred for the reasons stated by CPW and, in particular, in not adopting CPW's proposed LRIC+EPMU method. We concluded that Ofcom's approach was reasonable. We did not take a view on whether Ofcom should have given some or no weight to other considerations or have set the price controls so that the differential corresponded exactly to Ofcom's estimates of LRIC differentials.

3.223 We noted Ofcom's argument that it had not set other BT charges on a LRIC+EPMU basis. We consider that whilst, in principle, Ofcom could change its approach to setting these charges in future price controls, the examples given by Ofcom further illustrated the complexity involved in attempting to optimize charges. In addition, widening the scope of considerations would bring into the frame more products and services over which BT does not have a monopoly, such as the provision of core network services.

3.224 We consider that CPW's approach took no account of Openreach not having a monopoly in the supply of inputs to the delivery of voice and broadband services. To set allocatively efficient prices, applying Ramsey pricing principles, would require charges to be set across the set of products that are linked on the demand and/or supply side.

3.225 CPW's approach has the potential to distort competition between mobile and fixed telephony, resulting, in particular, in inefficient use of higher-cost mobile voice services. CPW itself recognized that retail demand for fixed and mobile voice and broadband services was not independent. In particular, CPW said that Ofcom's approach, which resulted in WLR charges that were too low, could create a competitive distortion in relation to other technologies, such as mobile, that were seeking to compete with fixed-line provision of voice services to the low-usage segment.[234]

3.226 In its response to the provisional determination, CPW said that we seemed to suggest that it would not be appropriate to set prices for MPF, SMPF and WLR to optimize allocative efficiency since other regulated products would not have their prices set in the same way. In CPW's view, referring to other regulated products constituted an error both of fact and of law. In CPW's view, altering the structure of

[234] CPW W/S Houpis III, §32.

prices between MPF, SMPF and WLR had no direct impact on other products. To suggest otherwise was an error of fact. It also said that the CC was required to determine the appeal by reference to, and by reference only to, those matters raised in the grounds of appeal (in accordance with section 195(2) of the 2003 Act). Consequently, any attempts to achieve a globally consistent outcome in this Reference would not within the CC's remit. CPW contended that such matters, if they arise at all, are for Ofcom when revising this or other price controls. It was said that the CC had accordingly erred in law.

3.227 The first of CPW's points – the alleged error of fact - relates to its understanding of paragraphs 3.224 and 3.225 above. However, as set out in paragraph 3.225, earlier in this appeal, CPW itself recognized that retail demand for fixed and mobile voice and broadband services were not independent. In particular, CPW said that Ofcom's approach, which resulted in WLR charges that were too low, could create a competitive distortion in relation to other technologies, such as mobile (see paragraph 3.225). We do not agree with CPW's view as set out in its response to the provisional determination.

3.228 In terms of the second alleged error, an error of law, this relates to paragraph 3.223 above. CPW has misunderstood our conclusion in this paragraph. In it, we note Ofcom's argument and the complexity that could arise if Ofcom changed its approach. We have not sought to consider matters outside the grounds of appeal. Our approach on this particular point is entirely consistent with our approach as set out in paragraph 1.59, namely to consider the grounds of appeal in their context. We considered that Ofcom was entitled to take into account the broader regulatory impact of CPW's proposed change in the price control. As a result we disagree with CPW's view.

Risk that LRIC+EPMU-based pricing would result in inefficient investment in MPF and a distortion of competition

Arguments

Inefficient investment

3.229 Ofcom argued that CPW's LRIC+EPMU approach could result in inefficient investment by CPs in MPF, and so higher overall costs of providing access services. In response to this, CPW said that Ofcom had given too much weight to productive efficiency, at the expense of dynamic and allocative efficiency, and the concern about possible substitution between MPF and WLR+SMPF as a result of setting price differences above LRIC was not as serious as Ofcom seemed to believe. CPW concluded that the potential for productive inefficiencies arising from a wider differential in charges was small.

Distortion of competition

3.230 Ofcom said that CPW's approach would 'tend to disadvantage operators using WLR+SMPF' and, as a result, could 'conceivably reduce competitive pressures for broadband services'.[235]

3.231 CPW dismissed these concerns. It said that SMPF-based competition had been the major platform in 2004, but technology had moved on significantly in the last five

[235] Ofcom LLU Statement, §A4.94.

years, which needed to be reflected in the pricing structure.[236] CPW also said that such concerns would only be an issue if new entry was still possible, and if it was important to preserve the opportunities for stepped entry (as described by BT).

3.232 CPW also argued that:[237]

(a) according to Ofcom projections, whilst (non-BT) SMPF lines accounted for a majority of (non-BT) SMPF and MPF lines in 2009/10, this would be reversed by 2012/13;

(b) Ofcom confused the dynamic role that competition could have in promoting efficiency with seeking to protect the specific firms currently competing in the market;

(c) Ofcom did not present any evidence that there would be fewer competitors, or less intense competition to provide services over MPF than over WLR+SMPF, only that, given the historic pricing pattern, relatively more customers were served today using the latter; and

(d) there was no convincing argument that the cost structure of operators competing using MPF should be such as to create additional barriers to entry, or other obstructions to competition, which would reduce the intensity of competition between operators.

3.233 CPW noted that its proposals would result in lower charges for SMPF services and, therefore, would not necessarily be significantly disadvantageous to SMPF-based operators. CPW said that it was quite possible for one operator to be offering broadband based on SMPF while another operator offered fixed-line services using WLR.[238]

3.234 Ofcom said that a distortion of competition would arise if CPW's proposals resulted in consumers switching away from CPs using WLR+SMPF to CPs using MPF. This could be inefficient if consumers were only persuaded to switch to an MPF-based CP because that CP was able to offer a lower price because it used a wholesale input that had an artificially low price relative to wholesale inputs used by other CPs. Ofcom said that, in theory, CPs using MPF might be able to undercut rivals even though they had higher internal costs or were offering a worse service. This might mean that CPs using WLR+SMPF would be incentivized to switch to using MPF. Alternatively, as not all CPs may be equally well placed to use MPF, distorted wholesale prices could distort competition to favour CPs that were better placed to take advantage of MPF.[239]

3.235 BT argued that SMPF-based provision had made a significant contribution to competition. BT said that, in particular, it had allowed CPs to enter the broadband market and build a customer base via bitstream, then move up the value chain to invest in providing SMPF services, and then to broaden their scope of provision into narrowband by taking WLR and offering bundled services. BT said that, at that point, LLU providers might seek to utilize MPF.[240]

3.236 In response to CPW's statement that further new entry was probably very unlikely, BT said that there had been significant recent new entry including 48 new CPs taking

[236] CPW WLR bilateral hearing transcript, p31, lines 8–18.
[237] CPW W/S Houpis W/S I, §§77–81.
[238] CPW WLR bilateral hearing transcript, 30 April, p30, lines 2–14.
[239] Ofcom LLU Statement, §A4.41.
[240] BT W/S Tickel I, §19.

WLR lines from Openreach since January 2009 and a further 36 currently in establishment.[241]

Assessment

3.237 We agree with Ofcom that there is risk that CPW's LRIC+EPMU approach could result in inefficient use of MPF lines by distorting CPs' choices between WLR+SMPF and MPF and competition between CPs using different means of delivering voice and broadband services. We do not accept CPW's argument that productive inefficiencies resulting from a price differential that is greater than that justified by costs are likely to be small. Our reasons are as follows.

3.238 Whilst we noted CPW's view that its approach addressed Ofcom's concerns about productive inefficiency risks,[242] CPW's proposal would result in a wider differential between charges for WLR+SMPF and MPF than would be justified by costs. In particular, Table 3.2 above shows that for 2012/13 CPW's approach would result in a differential of £47, of which around one-third was due to the EPMU mark-up (including the cost category by cost category EPMU allocation of common costs).

3.239 CPW argued that Ofcom had overstated the degree of substitution between MPF and WLR/WLR+SMPF. In particular, CPW said that:

(a) Although, over the longer term, it was reasonable to expect a strong relationship between the price differential between MPF and WLR+SMPF and an operator's choice of wholesale product, such decisions would be influenced in the short term by factors other than just price, including the overall business strategy of an operator and the costs of migrating customers to a different technology, which were significant.[243]

(b) There were sunk transition costs of around £40 per customer for any customer who switched from one technology to another. These costs meant that substitutability was far from perfect at the margin.[244]

(c) As the CP's capital costs of providing retail services using MPF or WLR+SMPF were to a significant extent sunk, the substitutability of MPF for WLR+SMPF for existing customers was also reduced.[245]

3.240 We accept that the sunk costs of investment in SMPF and switching costs associated with migrating customers from SMPF to MPF were relevant in considering the potential impact of regulatory decisions on the choices made by CPs. However, we do not accept that it is appropriate for decisions in relation to charges for access services to be determined by short-term factors. CPW acknowledged that, over the longer term, differentials would be important to operators' choices between wholesale products. In addition, we note that these supply-side barriers to switching seemed to be relevant only to the provision of services to existing customers and might therefore be less relevant for CPs that are expanding their customer bases.

3.241 In addition, certain statements made by Sky during this appeal indicate that the relative price for MPF and WLR+SMPF was a factor that would influence CPs' decisions on whether to invest in MPF-based delivery. In particular, Sky said that,

[241]BT letter to the CC, 19 May 2010, Comments on CPW hearing transcript (p31, lines 8–14).
[242]Frontier Report, April 2010, p8.
[243]CPW W/S Houpis I, §49.
[244]CPW W/S Houpis IV, §19c.
[245]CPW W/S Houpis IV, §19d.

although it had decided to move to MPF,[246] Ofcom's decision to set MPF charges higher than Sky had been expecting would impact on its future investment plans. Sky added that it would affect its decision to [✄].[247] Sky said that the price of MPF services was an important consideration in both of these areas.[248]

3.242 We also consider that there are inconsistencies between CPW's views, on the one hand, that Ofcom had overstated the degree of technical substitution between MPF and WLR+SMPF and, on the other, CPW's argument that a wider differential was required to incentivize CPs to use MPF technology.[249] In particular, the latter suggests that CPW would expect a differential of the magnitude it is proposing to have an impact on CPs' choices between WLR+SMPF and MPF-based delivery.

3.243 In its response to the provisional determination, CPW said that its views were not inconsistent.It agreed that there would be some substitution (and so a wider differential would incentivize the use of MPF) but disagreed with Ofcom's view that substitution would be perfect. CPW also said that it agreed that barriers to substitution would reduce and had never argued the contrary.

3.244 We disagree with CPW's first point with regard to the inconsistencies in approach. CPW has, on one hand, downplayed the potential for productive inefficiency, arguing that Ofcom had overstated the extent to which a wider differential would result in switching whilst, on the other, arguing for price differentials to be set at levels at which some CPs would either switch to MPF-based provision or opt for this from the start. We also disagree with CPW's second point, namely that barriers to substitution would reduce. CPW's own evidence in Dr Houpis' witness statement[250] stated that '… The factors that limit the substitutability of MPF and WLR+SMPF, …, are expected to continue to exist in the future—none of these is expected to change substantially. There does not seem to be any reason, therefore, to expect substitutability to increase in the future.'

3.245 We therefore agree with Ofcom that there is a risk that a differential between charges for MPF and WLR+SMPF that is greater than cost could result in inefficient investment in MPF. In other words, it could lead to CPs making investment in MPF services that would not be justified by the underlying costs of delivering services using MPF rather than WLR+SMPF or the ability to offer consumers new or better services.

3.246 We also agree with Ofcom that the inefficient use of MPF lines to provide voice and broadband services could result from a distortion of competition between MPF and WLR+SMPF-based providers.

3.247 CPW argued that its approach would not necessarily be disadvantageous to SMPF-based providers because SMPF charges would be lower. We do not agree. SMPF can only be used in conjunction with WLR (whether provided by the same or different CPs). CPW's approach would result in a substantial increase in the differential between WLR+SMPF and MPF lines.

3.248 CPW downplayed the contribution that SMPF-based provision would make to competition in the future, arguing that *(a)* Ofcom's own forecasts showed that, by 2012/13, the majority of lines used by CPs (excluding BT) would be MPF lines; *(b)* SMPF was

[246] Sky W/S Bushel, §28.
[247] Sky W/S Bushel, §33.
[248] Sky W/S Bushel, §§35 & 36.
[249] CPW LLU NoA, §95.3.
[250] CPW W/S Houpis I, §§22 & 23.

an out-of-date platform for competition that had been superseded by MPF; and *(c)* there was unlikely to be further SMPF-based entry.

3.249 With regard to the importance of SMPF-based provision in the future, we consider that CPW was prejudging how the retail provision of voice and broadband services would develop, including the choices that CPs will make on the relative use of MPF and WLR+SMPF lines and the likelihood of further new entry. Furthermore, we found that it was proposing a structure for prices that would tend to favour this outcome.

3.250 Also, Ofcom clarified that although it had observed a trend towards MPF and away from WLR and SMPF by some major CPs, it did not anticipate that this trend would leave BT as the only user of SMPF. Ofcom said that there were certain CPs which did not wish to replace WLR with their own MPF-based voice service, either at all or in areas where investment of this nature was not warranted.[251]

3.251 BT told us that it expected there to be an increase in demand from CPs other than BT for WLR. Overall, it expected there to be a growth in the number of MPF lines with quite a lot of this growth accounted for by Sky and CPW moving their customer bases away from using WLR and SMPF, on to using MPF.[252]

3.252 Based on the forecasts in the Oak model for 2012/13, there are expected to be twice as many SMPF as MPF lines. BT Retail will account for a large proportion of the SMPF lines, but CPW said that in 2012/13 over one-third of non-BT lines would be SMPF. We agree with Ofcom that if SMPF remains as important a platform for delivering broadband services as these figures suggest, to distort competition between SMPF+WLR and MPF-based provision could result in inefficient outcomes. In particular, it could result in MPF-based providers that have higher costs or offer less attractive products being able to attract customers away from SMPF providers only because users of WLR lines are required to make larger contribution to the recovery of fixed and common costs.

Benefits of promoting MPF-based competition

Arguments

3.253 CPW said in its WLR NoA that dynamic efficiency considerations required that providers were incentivized to use the technology (MPF) which would tend to encourage stronger and deeper network-based long-term competition, with its associated benefits.[253] CPW argued that the structure of the price controls should take into account the greater benefit that MPF-based competition delivered, and that setting the price difference above LRIC was the appropriate way to achieve this. CPW considered its arguments to be entirely consistent with Ofcom’s declared policy objectives.[254]

3.254 CPW said that Ofcom had a primary duty to further the interests of consumers through the promotion of competition.[255] CPW also said that Ofcom had decided that the most appropriate model of competition to foster was network-based competition rather than resale-based competition. In particular, it felt that LLU-based network competition would deliver superior consumer benefits, since the competition between networks would drive more innovation, greater choice and lower costs and prices—

[251] Ofcom letter to the CC, 27 May 2010.
[252] BT WLR bilateral hearing transcript, 13 May 2010, p15 lines 26–29 and p16 lines 1–5
[253] CPW LLU NoA, §95.3.
[254] CPW letter to the CC, 25 May 2010, §18.
[255] CPW LLU NoA, §52.1.

for example, faster download speeds, new features, better network quality, more costs exposed to competitive pressure and greater pricing innovation. CPW referred to the following paragraph in Ofcom's statement on Broadband Regulation dated 30 June 2005: 'Ofcom believes that Local Loop Unbundling (LLU)—in which a provider takes either partial or full control of the customer's connection—is the most effective means of delivering more innovation, greater choice and lower prices in broadband'.[256]

3.255 CPW said that Ofcom took a number of significant steps in 2004 and 2005 to actively encourage LLU-based networks to develop. Prior to this, LLU-based networks had not developed to any material extent, with, in January 2004, only 11,000 lines or 0.3 per cent of all broadband lines had been provided this way due to, in the main, poor-quality wholesale LLU products and excessive LLU prices.

3.256 CPW said that Ofcom itself had stated that deeper network competition would be preferable to competition that involved a lower level of investment and less network ownership by other operators and that Ofcom must therefore accept that competition based on MPF was preferable.

3.257 Ofcom did not accept CPW's interpretation of Ofcom's policy objectives. Ofcom said that when it talked about network-based competition, it would include the delivery of services using SMPF and MPF lines.[257] Ofcom also said that its policy was the promotion of efficient and sustainable competition and that relative charges for WLR+SMPF vs MPF that reflected underlying costs were more likely to be sustainable.[258]

3.258 By way of background, Ofcom explained that to promote network-based competition using MPF and SMPF it had put in place a floor on the price that BT could charge for wholesale products between 2005 to 2008 as a way of providing entry assistance. It had, however, always envisaged that this would come to an end at a point when new entrants were able to gain sufficient scale to stand on their own feet.[259]

3.259 As to its reasons for believing that a LRIC+EPMU approach established an appropriate balance between competing efficiency considerations, CPW said that the only risk associated with its approach was stronger MPF-based competition than would otherwise be the case.[260] CPW added that, in its view, allocative and dynamic efficiency were as important as, if not more important than, productive efficiency, and the potential impact from productive efficiency distortion was small.

3.260 CPW defined dynamic efficiency benefits to be those benefits, related to long-run developments in the market, which ultimately served the consumer.[261] CPW argued that dynamic efficiency considerations required that providers were incentivized to use the technology which tended to encourage stronger and deeper network-based long-term competition (ie MPF),[262] with the promise of delivering lower costs and more innovation, leading to a widening of the choice of suppliers and products to the final consumer.[263]

---

[256]Broadband Regulation Statement, June 2005, §4.
[257]Ofcom WLR bilateral hearing transcript, 6 May, p24, lines 1–5.
[258]Ofcom WLR bilateral hearing transcript, 6 May, pp25&26, lines 30–6.
[259]Ofcom WLR bilateral hearing transcript, 6 May, p20, lines 17–27.
[260]CPW WLR bilateral hearing transcript, 13 May, p23, lines 1–20.
[261]CPW W/S Houpis I, §66.
[262]CPW LLU NoA, §95.3.
[263]CPW W/S Houpis I, §69.

3.261 CPW also contended that competition based on MPF was preferable to competition based on WLR+SMPF.[264] CPW said that its appeal was about the appropriate form of competition in the retail market between BT and other operators using BT's network.

3.262 Ofcom did not accept that dynamic efficiency considerations pointed to a differential significantly greater than the difference in the respective LRICs. In coming to this view, Ofcom considered the potential gains from increased competition in broadband and voice services, and the importance of providing a stable regulatory framework. Ofcom said that it put weight on how it had set charges in the past and stakeholders' reasonable expectations for charges in the future, so as to enable a climate for efficient investment.[265]

3.263 With regard to setting prices to encourage MPF-based competition, Ofcom said that:[266]

> We remain of the view that sustainable and effective competition requires that—in the long term—entrants must be able to compete without special protection. This suggests that prices should be set in the longer term to cover efficiently incurred costs, and that relative prices should not distort the choices among products made by CPs.

3.264 Ofcom said that if there were significant benefits for CPs of moving to using MPF, then it would expect them to move to using MPF when it was most efficient for them to do so. There should be no need artificially to set prices to give them such an incentive. Maintaining an artificially high differential between MPF and WLR+SMPF might encourage operators to make the transition earlier than would be efficient.[267]

Assessment

3.265 We were not persuaded by CPW's arguments that Ofcom's policy objectives meant that the price controls should take into account the greater benefits of MPF-based competition. We consider that Ofcom's policy does not explicitly require that competition is promoted in the way argued by CPW such that the provision or take-up of MPF-based services is specifically encouraged. Ofcom's statements and actions to which CPW referred (see paragraph 3.254 above) are concerned with LLU, which includes MPF and SMPF services, and not solely MPF. Ofcom was clear in its bilateral hearing[268] that it included in the term 'network-based competition' the delivery of services in competition with BT and other CPs using SMPF services.

3.266 In its response to the provisional determination, CPW disagreed with our interpretation of Ofcom's policy regarding the relative benefits of MPF and WLR/SMPF-based competition. CPW said that in Ofcom's Strategic Review of Telecommunications, Ofcom noted that its first principle was to 'promote competition at the deepest levels of infrastructure where it will be effective and sustainable'.[269] CPW told us that there was no doubt that MPF-based competition was a deeper and therefore better form of competition than WLR-based competition (since it allowed

[264] CPW letter to the CC, 25 May 2010, §18.
[265] Ofcom LLU Defence, Annex D, §36.
[266] Ofcom LLU Defence, Annex D, §37.
[267] WLR Statement, §A4.95.
[268] Ofcom WLR bilateral hearing transcript, 6 May, p24, lines 1-11
[269] For example, quoted in http://stakeholders.ofcom.org.uk/consultations/ngn/, §1.9.

greater innovation and competition). CPW also said that MPF-based competition was also effective and sustainable.[270]

3.267 However, as we noted in paragraph 3.257 above, Ofcom said that when it talked about network-based competition, it would include the delivery of services using SMPF and MPF lines[271] and that its policy of the promotion of efficient and sustainable competition was more likely to be sustainable when relative charges for WLR+SMPF vs MPF that reflected underlying costs.[272]

3.268 CPW's argument is that because of the benefits to consumers from more MPF-based provision of voice and broadband services, CPs should be incentivized to use MPF-based technology. We understand from this that CPW would expect its approach to result in a faster take-up of MPF service than would otherwise be the case. In this case, we were not persuaded by CPW's arguments for promoting MPF-based competition. In particular, we are not persuaded that there would be benefits from promoting MPF-based delivery of voice and broadband services that would be sufficient to outweigh the concerns associated with adopting a LRIC+EPMU approach, for example, the risk of inefficient investment in MPF and distortion of competition in the delivery of voice and broadband services to the detriment of customers.

3.269 In particular, CPW argued that MPF-based provision would result in stronger competition, given the great opportunities for CPs to reduce costs and offer better services, which would be beneficial to customers. We were not, however, persuaded that the current level of competition in the retail markets for narrowband and broadband services was such as to warrant such intervention.

3.270 We also noted CPW's argument that with MPF-based delivery there is competition to BT in the provision of more of the network and, in particular, competition in the provision of equipment within the local exchanges. This is what we understand that CPW means by deeper or stronger competition. However, we consider, for the reasons given above,[273] if relative charges for MPF and WLR+SMPF are aligned to costs, if CPs able to provide the relevant equipment themselves more efficiently than BT then they would have the incentive to do so. Also, if MPF-based CPs are able to provide cheaper and/or more innovative services we would expect them to be able to attract customers. A greater differential could result in inefficient investment in MPF resulting in higher, not lower, costs.

Determination in relation to CPW's arguments for LRIC+EPMU approach

3.271 Our conclusion is that Ofcom did not err in failing to adopt a LRIC+EPMU approach.

3.272 We accept that an EPMU approach is one method that can be used in the allocation of fixed and common costs, but we also agree with Ofcom that this can produce an arbitrary solution.[274] We did not consider that this approach was appropriate in this case, for any of the reasons advanced by CPW.

---

[270] CPW said that exactly the same reasoning led Ofcom to prefer SMPF-based competition over IPStream-based (wholesale broadband) competition for broadband services. Both were network-based since they required some network but SMPF was preferred since it was deeper.
[271] Ofcom WLR bilateral hearing transcript, 6 May, p24, lines 1–5.
[272] Ofcom WLR bilateral hearing transcript, 6 May, pp25&26, lines 30–6.
[273] See Section 3: Part 1, paragraphs 37–49.
[274] Ofcom LLU Defence, Annex D, §19.

3.273 We consider that CPW has failed to demonstrate that Ofcom should in this case have given more weight to promoting allocative and dynamic efficiency. In particular, we consider that CPW has not made a case that allocative efficiency alone would require consumers of services delivered using WLR lines to make a greater contribution to the recovery of fixed and common costs in the access network. We consider that CPW's proposed limited application of Ramsey pricing principles is overly simplistic in mapping demand for MPF and WLR lines respectively to demand for broadband and voice services and too narrowly focused on the relative prices of MPF and WLR.

3.274 We also agree with Ofcom that to attempt to set prices to reflect the various efficiency considerations raised by CPW would be practically very difficult and that there are substantial risks associated with getting this wrong. Whilst we noted CPW's statements that it was not asking for full implementation of Ramsey pricing, it remained the case that CPW was asking for prices to be set to reflect the underlying characteristics of demand for the WLR and MPF services. In addition, we do not accept CPW's argument that the potential for productive inefficiency arising from a wider differential is small.

3.275 Even if we had accepted CPW's argument that Ofcom took insufficient account of allocative and dynamic efficiency considerations, we do not consider that CPW has demonstrated that LRIC+EPMU would achieve an appropriate balance between the various efficiency considerations. CPW's position was that dynamic efficiency required that CPs were incentivized to use MPF, which would tend to encourage stronger and deeper long-term competition with its associated benefits for consumers.[275] We were not persuaded by this. In particular, we considered that there was a danger that this approach could result in inefficient investment in MPF and a distortion of competition to the disadvantage of consumers.

3.276 Given the real risk of distorting investment decisions which could affect costs for many years, we considered that it was reasonable for Ofcom to take the view, as it did, that the best it could hope to achieve was to encourage charges which reflected costs.

3.277 In view of this conclusion, we have not found it necessary to respond specifically to arguments on the following:

(a) Ofcom said that CCA FAC was a form of LRIC + mark-up for common costs.[276] CPW did not accept this.[277] As mentioned, we focused on CPW's arguments for its preferred approach and, in particular, for a differential between WLR and MPF charges that is greater than justified by incremental costs.

(b) Ofcom argued that a CCA FAC approach had the benefits of being widely understood and recognized and that the input data was capable of being reconciled to regulatory accounts. As we have already said, we focused on the arguments made by CPW for its preferred approach.

(c) Ofcom and CPW each provided estimates on the implications for allocative and/or productive efficiency of the CCA FAC or LRIC+EPMU approaches. We have not found it necessary to rely or comment upon these calculations in taking a view on CPW's case.

[275] CPW WLR NoA, §82.2.
[276] Ofcom WLR Defence, §16.
[277] CPW letter to the CC, 27 April 2010.

Determination in respect of Reference Question 2

3.278 Our determination is as follows: for the reasons given above (in paragraphs 3.176 to 3.179, 3.190 to 3.199, 3.206 to 3.209, 3.214 to 3.228, 3.237 to 3.252 and 3.265 to 3.276), we do not consider that Ofcom erred by setting the WLR Price Controls at a level which is inappropriate as claimed by CPW in §§76 to 107 of the WLR NoA. We do not consider that Ofcom should have set these controls in such a way as to secure that the differential between on the one hand, the price for WLR and/or WLR+SMPF and, on the other hand, MPF was greater than the differential between the LRICs of those services.

Reference from the Competition Appeal Tribunal to the Competition Commission

IN THE COMPETITION APPEALTRIBUNAL **Case No: 1111/3/3/09**

BETWEEN:

THE CARPHONE WAREHOUSE GROUP PLC

Appellant

- supported by -

BRITISH SKY BROADCASTING LIMITED

Intervener

-v-

OFFICE OF COMMUNICATIONS

Respondent

- supported by -

BRITISH TELECOMMUNICATIONS PLC

Intervener

REFERENCE OF SPECIFIED PRICE CONTROL MATTERS TO THE COMPETITION COMMISSION 18 FEBRUARY 2010

---

1. Having regard to:

(A) the Statement, Consultation and Notification issued by the Office of Communications ("OFCOM") dated 26 October 2009 and entitled "Charge controls for Wholesale Line Rental and related services" ("OFCOM's WLR Statement");

(B) the price controls set by Condition AAA4(WLR) in Annex 6, Schedule 1 of OFCOM's WLR Statement ("the WLR Price Controls"); and

(C) the Notice of Appeal ("the Notice of Appeal")[1] dated 23 December 2009 lodged by The Carphone Warehouse Group Plc ("CPW") in Case 1149/3/3/09 challenging certain aspects of the setting of the

[1]All references to the pleadings herein should be understood as references to the pleadings as amended, insofar as appropriate.

WLR Price Controls and the statement within that Notice that the appeal raises specified price control matters within the meaning of Rule 3(1) of the Competition Appeal Tribunal (Amendment and Communications Act Appeals) Rules 2004 ("the 2004 Rules");

(D) the Order of the Tribunal dated 3 February 2010 establishing a timetable for the further conduct of this appeal

the Tribunal, pursuant to Rule 3(5) of the 2004 Rules and section 193 of the Communications Act 2003 ("the 2003 Act"), hereby refers to the Competition Commission for its determination the specified price control matters arising in these appeals.

2. By this reference the Tribunal orders the Competition Commission to determine the following questions:

Question 1

Whether, for reasons set out within paragraphs 76 to 107 of the Notice of Appeal, the WLR Price Controls have been set at a level which is inappropriate because OFCOM failed to set the controls in such a way as to secure that the differential between, on the one hand, the price for WLR and/or WLR + SMPF and, on the other hand, MPF was *at least equivalent to* the long run incremental cost ("LRIC") difference between those services:

(i) by reason of OFCOM setting the price differentials on a current cost accounting and fully allocated costs basis rather than on a LRIC basis, as explained, in particular in paragraphs 87 and 88 of the Notice of Appeal; or

(ii) by reason of OFCOM having erred in its calculation of LRIC for the reasons set out in paragraphs 92 to 105 of the Notice of Appeal.

Question 2

Whether, for reasons set out within paragraphs 76 to 107 if the Notice of Appeal, the WLR Price Controls have been set out at a level which is inappropriate because OFCOM should have, but did not, set those controls in such a way as to secure that the differential between on the one hand, the price for WLR and/or WLR + SMPF and, on the other hand, MPF was *greater than* the difference between the LRIC of those services.

Question 3

Having regard to the fulfilment by the Tribunal of its duties under section 195 of the 2003 Act and in the event that the Competition Commission determines that OFCOM erred in one or more of the ways referred to in the Questions 1 and 2, the Competition Commission is to include in its determination:

(i) clear and precise guidance as to how any such error found should be corrected; and

(ii) insofar as is reasonably practicable, a determination as to any consequential adjustments to the level of the WLR Price Controls, indicating—

(a) what price controls should have been set in OFCOM's WLR Statement had OFCOM not erred in the manner identified; and

(b) if the WLR Price Controls set in OFCOM's WLR Statement have during the elapsed period of those price control been at an inappropriate level, and on the assumption that it may, having regard to the criteria in section 88 of the 2003 Act, be lawful and appropriate to adjust the price controls applicable during the unelapsed period, what adjustments to that part of the WLR Price Controls should be made, if any.

3. The Competition Commission is directed to determine the issues contained in this reference by 31 August 2010. The Competition Commission shall notify the parties to this appeal of its determination at the same time as it notifies the Tribunal pursuant to section 193(3) of the 2003 Act.

4. Should the Competition Commission require further time for making its determination it should notify the Tribunal and the parties so that the Tribunal may decide whether to extend the time set out in the previous paragraph.

5. There shall be liberty to apply for further directions.

Vivien Rose
Chairman of the Competition Appeal Tribunal

Made: 18 February 2010

Glossary of definitions and frequently used terms

2003 Act	Communications Act 2003.
2004 Rules	Competition Appeal Tribunal (Amendment and Communications Act Appeals) Rules 2004.
20CN	**BT**'s legacy broadband network.
21CN	**BT**'s 21st century network programme for rolling out an **NGN**.
Access Directive	Directive 2002/19/EC on access to, and interconnection of, electronic communications networks and associated facilities.
Access network	The part of a telecommunications network that connects an end-user (eg a residential customer) to the core telecommunications network. The **exchange** to the core network will often occur at a local telephone **exchange**.
Backhaul	Carriage of traffic from an **exchange** to a central point: transmission links used to connect local **exchange**s to each other and/or the **core** network.
Bore	An individual **duct** tube laid into a trench. A **duct** may contain multiple bores.
BT	BT Group plc (which includes British Telecommunications plc). **Openreach** is an operating division of British Telecommunications plc.
BT Retail	Operating division of BT. BT Retail provides retail telecommunications services to businesses and residential customers.
BT WLR SoI	BT Statement of Intervention dated 26 February 2010, in relation to the **WLR Appeal**.
Calls to Mobiles Appeal	The judgment of the **Tribunal** in relation to the price control matters in *Hutchison 3G UK Limited v Office of Communications* (Case 1083/3/3/07) and *British Telecommunications plc v Office of Communications* (Case 1085/3/3/07), *[2009] CAT 11* (Judgment: Disposal of the Appeals).
CC	Competition Commission.
CCA	Current cost accounting (an accounting convention, where assets are valued and depreciated according to their current replacement cost whilst maintaining the operating or financial capital of the business entity).
CF Final Model	**Ofcom**'s activity-based costing model for **Openreach**.
Combi-card	A piece of technical equipment which, along with an **MSAN**, allows voice or data (or both) to be used for a single customer.
Compressible costs	Costs that may be reduced, eg through efficiency savings.

Copper access network	The part of the access network formed from pairs of copper wires bundled together into cables which are then laid in **duct**s, carried overhead on poles or directly buried into the ground.
Copper line	An individual pair of copper wires.
Copper loop	As per a **copper line** but usually used to refer to the metallic path between the **exchange** and the customer premises.
Core	The part of the network used for high-capacity long-distance switching and transmission.
Cost stack	A term **Ofcom** used in the **LLU Statement** to describe the combined operating and capital cost for a unit of a particular service or services.
CP	Communications provider.
CPW	Carphone Warehouse Group plc.
CRF	European Common Regulatory Framework.
CRS	Core rental services. **WLR**, **SMPF** and **MPF** are referred to by **Ofcom** as the 'Core Rental Services'.
DAM	Detailed Attribution Methods.
DP	Distribution point (the point in the **access network** from which the **drop wire** is provided to the customer).
Drop wire	The pair of (aerial) copper wires which run from a pole to the end-user premises.
DSL	Digital subscriber line (a technology for bringing high-bandwidth information to homes and small businesses over ordinary copper telephone lines).
DSLAM	Digital subscriber line access multiplexer (electronic equipment provided by the **CP** and used to provide broadband services).
Duct	A facility of one or more buried tubes through which cables can be routed. Ducts are the infrastructure, eg pipes, in the ground in which cables containing copper and/or fibre are run.
ECN	Electronic communication network. A network that enables inter-communication between users of that network.
ECPR	Efficient Component Pricing Rule.
EOI	Equivalence of inputs. Legal requirement contained in the **BT Undertakings** requiring **Openreach** to supply **LLU** services (and most **LLU** ancillary services) to **CP**s (including **BT**) on the same basis.
EPMU	Equal proportionate mark-up. This means that the mark-up for common costs is in proportion to the incremental cost.

ERG	European Regulators Group. The group through which National Regulatory Authorities exchange expertise and best practice and give opinions on the functioning of the telecommunications market in the EU.
Exchange	The building and equipment located within the exchange area and to which all customers are connected via the **access network**.
FAC	Fully allocated cost. An accounting approach under which all the costs of the company are distributed between its various products and services. The FAC of a product or service may therefore include some common costs that are not directly attributable to the service.
FL-LRIC	Forward-looking long-run incremental cost.
Frame	The physical frame in a **BT** telephone **exchange** which **copper loop**s are connected to on one side, and which is connected to the **core network** on the other side (also called **MDF** or main distribution frame).
Framework Directive	Directive 2002/21/EC on the common regulatory framework for electronic communications networks and services.
Frontier	Frontier Economics Ltd: an economics consulting firm.
Frontier model	LRIC+EPMU model produced by Frontier received on 20 May 2010.
Frontier report	Paper produced by **Frontier** on behalf of **CPW** received on 27 April 2010.
FTE	Full time equivalent employee.
FTTC	Fibre to the cabinet.
FTTP	Fibre to the premises.
HCA	Historical cost accounting.
HDF	Handover distribution frame (a frame assembly provided to **CP**s in the **MUA**) which serves as a demarcation point between **Openreach**'s and the **CP**'s domains.
Infrastructure	General term used to refer to all the equipment and plant used to provide connectivity and services to customers.
Jumpering	The process of connecting *(a)* the copper wires connecting the end-user's premises to the **MDF** at the **exchange** to *(b)* a tie circuit feeding into a **line card**.
Line card	The interface providing active electronics between the copper network and the **CP**'s network. A line card provides the capabilities for voice and/or broadband services and physically sits within a chassis within the **MSAN** or **DSLAM**.

LLU	Local loop unbundling. The process by which providers take control (in whole or in part) of the **copper loop** connecting a customer's premises to the local telephone **exchange**. The provider is given access to the **exchange** to install its own equipment to connect the customer to the provider's own network.
LLU Appeal	*The Carphone Warehouse Group plc v Office of Communications* (Case No 1111/3/3/09).
LLU Statement	**Ofcom**'s decision on charge controls for **MPF**, **SMPF** and associated ancillary services contained in: *A New Pricing Framework for Openreach*, dated 22 May 2009.
LRIC	Long-run incremental cost. The cost caused by the provision of a defined increment of output given that costs can, if necessary, be varied and that some level of output is already produced.
MCT Determination	The **CC**'s determination on the price control matters in the **Calls to Mobiles Appeal**.
MDF	Main distribution frame. The mechanical frame within the **exchange** through which all **copper loop**s are cross-connected to a **copper line** connected to the **core** infrastructure. The physical frame in a **BT** telephone **exchange** which **LLU copper loop**s are connected to on one side, and which is connected to the **BT core** network on the other side.
MEA	Modern equivalent asset.
MPF	Metallic path facility. The pair of metallic wires which provide a physical connection between the **MDF** and the end-user. When a **CP** is provided by **Openreach** with MPF, it is essentially renting the wires from a given customer's premises to an **exchange**, enabling the **CP** (together with other aspects of the **CP**'s network) to provide both voice and broadband services in competition with **BT** and other retail providers of such services.
MSAN	Multi-service access node. Electronic equipment provided by the **CP** and used to provide voice and broadband services.
MUA	Multi-user area. Area in a **BT** telephone **exchange** in which **CP LLU** equipment is located.
NBV	Net book value.
NGA	Next generation access. The upgrade of infrastructure which brings fibre closer to the end customer (often referred to as either **FTTC** and/or **FTTP**).
NGN	Next generation network. The upgrade of infrastructure within a telecommunications network, primarily based on the digital transfer of information across the **core** but which may also encompass improvements to those parts of the **access network** located within the **exchange**.
NPV	Net present value.

NRA	National regulatory authority.
Oak Model	**Ofcom**'s financial model which allocates costs to activities/products and calculates unit costs.
Ofcom	Office of Communications.
Openreach	An operating division of British Telecommunications plc, Openreach provides wholesale telecommunications services to **CP**s.
Operating division	(Within the context of the BT Group.) The core operating businesses that make up **BT**—ie **Openreach**, BT Wholesale, **BT Retail** and BT Global Services.
PSTN	Public switched telephone network.
Ramsey pricing	Pricing a product where the mark-up of each commodity is inversely proportional to the elasticities of demand.
RAV	Regulatory asset value.
RAV Model	**Ofcom**'s financial model calculating certain asset and depreciation balances.
Reference	Ruling on the Reference of Specified Price Control Matters to the Competition Commission dated 27 November 2009 in relation to the **LLU Appeal**.
Reply I	**CPW** Reply I dated 22 January 2010 in relation to the **LLU Appeal**.
Reply II	**CPW** Reply II dated 9 February 2010 in relation to the **LLU Appeal**.
Reply V	**CPW** Reply V dated 29 March 2010, submitted in relation to the **WLR Appeal**.
Reply VI	**CPW** Reply VI dated 21 May 2010, submitted in relation to the **LLU Appeal** and **WLR Appeal**.
RFS	Regulatory financial statements. Audited financial statements that **BT** is required to produce and publish each year to comply with its regulatory obligations.
RPI	Retail prices index.
Second Consultation	**Ofcom** consultation document of 5 December 2008 entitled 'A New Pricing Framework for Openreach—second consultation' with proposals for new charge controls to cover **WLR**, **MPF** and **SMPF** wholesale services.
Sky	British Sky Broadcasting Limited.
SMP	Significant market power.

SMPF	Shared metallic path facility. When a **CP** is provided by **Openreach** with SMPF, rather than having access to the entirety of the frequencies on the wire to the final consumer as for **MPF**, the **CP** rents only that part used for provision of broadband services. In order to receive voice services, the customer must be provided with a service by a **CP** buying **WLR** from **Openreach**, or by **BT**. The end-consumer may buy broadband services (using SMPF) and voice services (using **WLR**) from the same provider or from different providers.
SOR	Statement of Requirement. Openreach's customers may submit a request (Statement of Requirement) to Openreach: to create a new product; for a change to an existing product.
TAM	Test access matrix: • The *Openreach TAM* is a relay switch that is connected (via jumpers on the **MDF**) to the **LLU** circuit to enable **Openreach** to carry out diagnostic tests on the **LLU** circuit—the TAM is connected to the line test platform to enable this to happen. • The *CP TAM* is connected between the **CP DSLAM** and the **HDF**, and enables the **CP** to carry out service layer testing. • The *Openreach EvoTAM* (evolutionary TAM) is a specific TAM installed in **21CN**-enabled **exchange**s—it enables **Openreach** to offer the test access product, which **CP**s can purchase instead of installing their own **CP** TAM.
TDM	Time division multiplex.
Tie cables	The cables used to connect the **CP**-installed electronic equipment in the **exchange** to the **frame**.
Tribunal	Competition Appeal Tribunal.
TSR	**Ofcom**'s Telecommunications Strategic Review.
TTG	TalkTalk Group Limited.
Undertakings	Legal obligations agreed between **BT**, **Openreach** and **Ofcom** as part of the functional separation of **BT** and **Openreach**.
WBCC	Wholesale Broadband Connect Converged. Combined voice and broadband product to be offered to **CP**s by **BT** as part of **BT**'s **21CN** programme.
Wholesale Fixed Narrowband Review	**Ofcom** statement of 28 November 2003 in relation to its review.
Wholesale Local Access Review	**Ofcom** statement of 16 December 2004 in relation to its review of the wholesale local access market.
WLR	Wholesale line rental. An **Openreach** product whereby the provider (eg TalkTalk) rents a line from **Openreach** and resells the line to the end-customer. WLR provides a voice-only service, ie it is necessary for a provider to purchase WLR and **SMPF** if the provider wishes to offer the end-customer both voice and

	broadband services.
WLR Appeal	*The Carphone Warehouse Group plc v Office of Communications* (Case No 1149/3/3/09).
WLR Consultation	**Ofcom** consultation document of 3 July 2009 entitled *Charge controls for Wholesale Line Rental and related services*.
WLR Defence	**Ofcom** Defence dated 15 February 2010 in relation to the **WLR Appeal**.
WLR NoA	**CPW** Notice of Appeal dated 23 December 2009, in relation to the **WLR Appeal**.
WLR Reference	Ruling on the Reference of Specified Price Control Matters to the Competition Commission dated 18 February 2010 in relation to the **WLR Appeal**.
WLR Review	**Ofcom**'s statement of 24 January 2006, 'Wholesale Line Rental: Reviewing and setting charge ceilings for WLR services'.
WLR Statement	**Ofcom**'s decision on charge controls for **WLR** and associated ancillary services contained in: *Charge controls for Wholesale Line Rental and related services*, dated 26 October 2009.
WVC	Wholesale Voice Connect. Voice product to be offered to **CP**s by **BT** as part of **BT**'s **21CN** programme.