Mobile call termination market review 2015-18

Statement on the markets, market power determinations and remedies

NON-CONFIDENTIAL VERSION – REDACTIONS ARE INDICATED BY [✂]

Statement

Publication date: 17 March 2015

About this document

This document is a final statement setting out the conclusion of our review of the wholesale 'mobile call termination' (MCT) markets for the period 1 April 2015 – 31 March 2018.

MCT is a wholesale service provided by a mobile communications provider (MCP) to connect a call to a recipient on its network. When fixed or mobile communications providers enable their customers to call a UK mobile number, they pay the terminating MCP a wholesale charge, called a 'mobile termination rate' (MTR). MTRs are set on a per-minute basis and are currently subject to regulation.

We published a consultation document on 4 June 2014 outlining our regulatory proposals for MCT markets. We have taken account of points raised by stakeholders and new information received since the consultation.

On 6 February 2015, we notified our intended measures and an explanatory draft statement setting out the reasons for them to the European Commission (EC), BEREC and other National Regulatory Authorities (NRAs) and we published our draft statement on the Ofcom website. On 6 March 2015, we received comments from the EC and have taken utmost account of them in reaching our final decision.

In this document we set out our decisions, including the regulation that we conclude is appropriate for MCT markets.

The regulation we have decided to impose includes a charge control on the MTRs of all MCPs offering MCT and is designed to promote competition and further the interests of consumers.

Contents

Section 1

Summary

1.1 This final statement sets out the conclusions of our review of the wholesale 'mobile call termination' (MCT) markets for the period 1 April 2015 – 31 March 2018.

1.2 MCT is a wholesale service provided by a mobile communications provider (MCP) to connect a call to a recipient on its network. When fixed or mobile communications providers enable their customers to call a UK mobile number, they pay the terminating MCP a wholesale charge, called a 'mobile termination rate' (MTR). MTRs are set on a per-minute basis and are currently subject to regulation. Based on current volumes, we estimate the total revenues in 2014/15 from MCT in the UK to be around £504m which compares to total retail revenues in the UK mobile sector of £15.6bn in 2013.[1] If we consider "net" termination, i.e. we exclude mobile to mobile (M2M) off-net calls, the estimated revenue is around £141m.[2]

1.3 The purpose of this review is to analyse the state of competition in the provision of MCT and consider the appropriate form of *ex ante* regulation, if any, that should be imposed. To this aim we identify and define relevant markets that are susceptible to *ex ante* regulation and assess whether any MCP has significant market power (SMP).

1.4 The last MCT market review concluded on 15 March 2011 ('2011 MCT review'), found 32 MCPs had SMP in their relevant markets and introduced a significant change from previous MCT charge controls in the way we assessed the cost of MCT. In particular, in choosing the cost standard to calculate the charge control for the four largest MCPs, we moved from LRIC+ to LRIC, which resulted in a sharp reduction of MTRs – falling around 80% between March 2011 and April 2013.[3]

1.5 In June 2014 we published a consultation ('June 2014 Consultation') to seek stakeholders' views on our regulatory proposals for MCT for the period 1 April 2015 – 31 March 2018. We received 14 responses to the June 2014 Consultation.[4] Responses from stakeholders focused mostly on the following: the choice of cost standard and our reasoning to continue to use LRIC; our proposal to introduce a charge control for smaller MCPs for the first time; our proposal to impose a one-off adjustment to the new LRIC-based MTR and our proposal that over the top (OTT)

---

[1] For retail revenues see Ofcom, *Telecommunications market data tables Q4 2013*, 24 April 2014, http://stakeholders.ofcom.org.uk/binaries/research/cmr/telecoms/Q4-2013.pdf.

[2] Termination revenues are obtained by considering total and net termination volumes of 59.62 and 16.72 billion, respectively and the current MTR of 0.845ppm. Volumes refer to the four largest MCPs and include traffic carried on behalf of, or for, MVNOs or other third parties.

[3] Long Run Incremental Cost (LRIC) measures the incremental cost to an operator of providing a service in the long-run. It includes the variable and fixed costs associated with the service increment in question, in this case MCT. LRIC+ includes a mark-up for joint and common costs, such as the cost of the spectrum used by the network. By definition, the LRIC standard, as currently used to set the charge control, does not include such a mark-up.

[4] We also received one letter as part of the separate MTR enforcement programme which we regard as relevant to our policy decisions. Ofcom, *Own initiative enforcement programme into wholesale mobile call termination rates*, 11 November 2013, http://stakeholders.ofcom.org.uk/enforcement/competition-bulletins/open-cases/all-open-cases/cw_01115/

voice services didn't sufficiently constrain market power in MCT markets. Stakeholders also made a number of observations relating to the cost model used to calculate the regulated MTRs.

1.6 On 6 February 2015, we notified our intended measures and an explanatory draft statement setting out the reasons for them to the European Commission (EC), BEREC and other National Regulatory Authorities (NRAs)and we published our draft statement on the Ofcom website.[5] On 12 February 2015, the EC requested further information regarding the notified draft statement, which we provided on 17 February 2015. In its decision letter of 5 March 2015, the EC made comments in relation to the entry into force of the new LRIC rates.[6] As set out in Section 8, we have taken utmost account of the EC's comments. We received no responses from BEREC or any NRAs.

1.7 To inform our policy decisions, we have also considered the significant developments that have occurred in the mobile market in the last three years, recognising that the UK mobile sector has changed in ways that are relevant to this market review. Between 2011 and 2013, the availability of spectrum to provide mobile services has increased significantly following Ofcom's work on spectrum liberalisation and the 4G auction. The four largest MCPs[7] have started deployment of their fourth generation (4G) networks based on Long Term Evolution (LTE) technology and have launched 4G services. 4G networks are currently employed for data only but are expected to be used for voice in the future when some of the UK MCPs are expected to launch Voice over LTE (VoLTE).

1.8 Consumers increasingly use mobile networks for data connectivity: mobile data use has seen strong growth in recent years. This has been partly driven by the continued growth in both the numbers and use of smartphones. Smartphone ownership has risen from 27% in 2011 to above 60% in 2014. [8] As 4G take-up grows, we expect MCPs to deliver less traffic over 2G and 3G overall. In addition, the mix of voice and data delivered over existing technologies is also likely to change. Another trend concerns the design and deployment of more cost efficient mobile networks. This has been achieved, for example, by new network sharing arrangements.

1.9 Having considered these developments, the latest market data, stakeholders' responses to the June 2014 Consultation and the points raised by the EC in its letter of 5 March 2015, we set out in the rest of this document our decisions to:

1.9.1 Define 72 separate markets, each corresponding to an MCP able to set an MTR for calls to the UK mobile numbers allocated by Ofcom to that MCP (see Section 3).

1.9.2 Designate each undertaking holding UK mobile numbers as having SMP with respect to the (wholesale) market for terminating calls to such numbers (see Section 4). This recognises the commercial reality that control of the number range provides the mechanism by which pricing power is exercised in relation to calls to mobile numbers. Applying this approach will mean that

[5] http://stakeholders.ofcom.org.uk/consultations/mobile-call-termination-14/draft-statement/
[6] http://stakeholders.ofcom.org.uk/binaries/consultations/mobile-call-termination-14/statement/UK-2015-1706_Adopted_EN.pdf
[7] EE, H3G, Telefonica and Vodafone.
[8] Ofcom, *Infrastructure Report 2014*, 8 December 2014. http://stakeholders.ofcom.org.uk/binaries/research/infrastructure/2014/infrastructure-14.pdf

72 MCPs are designated with SMP. The list of affected MCPs is set out in Table 5 of Section 3.

1.9.3 Regulate the MTRs of all MCPs with SMP by imposing a single maximum cap on MTRs (see Section 5). This represents a change from the previous market review where the charge control only applied to the four largest MCPs and smaller MCPs were subject to an obligation to provide network access on fair and reasonable (F&R) terms and conditions, including charges. We consider that imposing a charge control on all MCPs with SMP will be more effective than the F&R approach in remedying the harm caused by MTRs set above the efficient cost benchmark.

1.9.4 Impose on all MCPs an obligation to provide network access on fair and reasonable terms and conditions and an obligation of price transparency requiring all MCPs to publish their MTRs (with any proposed change to their MTRs to be made at least 28 days in advance of those changes coming into effect) - see Section 5.

1.9.5 Impose only on the four largest MCPs an additional obligation of no undue discrimination in relation to the provision of network access for MCT (see Section 5).

1.9.6 Continue to use LRIC to set the charge control (see Section 6).

1.9.7 Implement an adjustment towards the new LRIC rate in the first year of the control (i.e. 2015/16) with MTRs in the first year mid-way between the current nominal MTR (0.845ppm) and the new forecast nominal LRIC rate, and subsequently an MTR cap at the new LRIC rate from the start of the second year of the three year control (i.e. from 1 April 2016).[9]

1.9.8 Adopt a transition period between publication of our final statement and 1 May 2015 for the new MTR levels to take effect.[10] We explain the rationale for this in Section 8.

1.9.9 The resulting MTR caps are summarised below:[11]

[9] This represents a small change from our June 2014 Consultation in which we proposed that MTRs would be reduced to the new LRIC rate with immediate effect (i.e. at the start of the first year of the control).

[10] During this period, we require the four largest MCPs to charge MTRs which do not exceed the regulated cap set for the period 1 April 2014 to 31 March 2015, i.e. 0.845ppm. For the same transition period, we would also expect smaller MCPs to charge no more than 0.845ppm. This also represents a small change from the consultation proposals.

[11] Since the draft statement was notified to the European Commission these results have been updated using the latest inflation forecasts compiled by HM Treasury, as explained in Section 8.

Table 1: Final MTR caps (pence per minute)

	Current MTR (from 1 April 2014)	From 1 April 2015	From 1 May 2015	From 1 April 2016	From 1 April 2017
Nominal prices[12]	0.845	0.845	0.680	0.513	0.507
2012/13 prices[13]	0.826	0.826	0.661	0.490	0.475
Value of X in CPI-X formula[14]	n/a	n/a	n/a	26.3%	3.1%

Source: 2015 MCT model.

[12] Forecasts from 1 April 2016 and 1 April 2017. The figure to be applied from 1 May 2015 has been calculated using outturn inflation for the prior calendar year, as explained in the SMP conditions.
[13] The MTR caps expressed in 2012/13 prices have been calculated by deflating the nominal cost path shown in the first row of Table 1. The result in 2016/17 and 2017/18 is slightly different to that shown in Table 15 later in this statement due to a combination of first calculating a nominal result and then deflating it, and rounding. The current MTR in 2012/13 prices is slightly different to that presented in the June 2014 Consultation due to the use of updated inflation data.
[14] Note that the values of X cannot simply be calculated from the real cost due to the application of the geometric conversion, as explained in Section 8.

Section 2

Introduction and background

Structure of the document

2.1 This statement consists of eight main sections and 15 supporting annexes.

- Section 1 summarises our conclusions.
- In Section 2 we set out the background to the review, in particular the relevant regulatory framework and the process we followed to gather the relevant evidence. We also explain our impact assessment and Equality Impact Assessment and recap on the current regulation in the UK and Europe. Finally, we provide some background to our conclusions on market definition by describing how mobile voice calls are delivered and the most recent developments in mobile networks.
- In Section 3 and Section 4 respectively we set out our decisions on market definition in relation to wholesale MCT and on determining which Communications Provider (CP) in these MCT markets have SMP.
- In Sections 5 to 8, we consider and conclude on which remedies to impose, given our conclusions on SMP. In particular, Section 5 sets out the appropriate remedies and concludes that among others a charge control is necessary and appropriate. Section 6 considers what cost standard should be used for the charge control, whose level is then set out in Section 7. Section 8 concludes with the details concerning the implementation of the charge control and how we will assess compliance with it.
- A series of Annexes support the analysis in the main body of the document and are an integral part of our reasoning. Annex 1 sets out the regulatory framework and Annex 2 our general approach to market definition and SMP assessment; Annex 3 the legal instruments; Annex 4 our analysis in relation to smaller MCPs; Annex 5 our analysis of the changes in consumer prices and usage since 2011 which are used to inform the choice of cost standard; and Annex 6 our Equality Impact Assessment. Annexes 7-13 relate to the cost model used for the charge control. Annexes 14 and 15 are the sources of evidence and glossary, respectively.

Regulatory framework

2.2 The applicable regulatory framework (known as the Common Regulatory Framework or 'CRF') has its basis in five EU Communications Directives ('the Directives') each of which has been implemented into national legislation.[15] It imposes a number of obligations on national regulatory authorities (NRAs), such as Ofcom. One of these obligations is to carry out various market reviews, including of the market for voice

[15] The harmonised EU regulatory framework for electronic communications was amended in 2009. Those amendments to the Directives were transposed into national legislation and came into effect from 26 May 2011.

call termination on individual mobile networks. The Communications Act 2003 ('the Act') also sets out Ofcom's duties, including our principal duty to further the interests of citizens in relation to communications matters and the interests of consumers in relevant markets, where appropriate by promoting competition. We set out the regulatory framework and the market review process in more detail in Annexes 1 and 2. In this section we set out, in summary, what the market review process involves.

2.3 Under Article 7 of the Framework Directive[16], NRAs are required to notify their draft statement (comprising the draft measure and the reasoning on which the measure is based) to the European Commission, BEREC and other NRAs upon completion of their own domestic consultation and having taken account of all stakeholder responses. The European Commission, BEREC and other NRAs may make comments within a month. The notifying NRA needs to take utmost account of any European Commission and BEREC opinions.

2.4 We have taken account of consultation responses (submitted as part of the domestic consultation) and have made modifications that appear appropriate to us in light of these comments. On 6 February 2015, we notified our draft measures and an explanatory statement setting out the reasoning on which the measures are based to the EC, BEREC and the regulatory authorities in every other member state under section 48B and section 80B of the Act (which transposes Article 7). We have taken utmost account of the EC's comments in its letter of 5 March 2015.

The market review process

2.5 A market review is carried out in three stages:

i) we first identify and define the relevant markets, appropriate to national circumstances;

ii) we then carry out analyses of these markets to determine whether they are effectively competitive, which involves assessing whether any operator has SMP in any of the relevant markets; and

iii) we finally assess the appropriate remedies which should be imposed where there has been a finding of SMP (known as SMP obligations or conditions), based on the nature of the competition problem identified in the relevant markets.

2.6 In carrying out a market review, NRAs are required to define markets "appropriate to national circumstances, in particular relevant geographic markets within their territory, in accordance with the principles of competition law".[17] In so doing, the Framework Directive requires that NRAs shall take "utmost account" of the European Commission's Recommendation on Relevant Product and Service Markets ('2014

[16] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:337:0037:0069:EN:PDF. The revised framework was transposed into UK law by the Electronic Communications and Wireless Telegraphy Regulations 2011 which came into force on 26 May 2011 and amended the Act. This notification requirement is implemented by Section 48B.

[17] See Article 15(3) of Directive 2002/21/EC of the European Parliament and of the Council of 7 March 2002 on a common regulatory framework for electronic communications networks and services (as amended by Directive 2009/140/EC), 7 March 2002 ('the Framework Directive'), http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02002L0021-20091219&qid=1399985618659&from=EN

EC Recommendation')[18] and SMP Guidelines[19]. In deciding on remedies, we are required to take utmost account of recommendations issued by the EC under Article 19(1) of the Framework Directive, including the 2009 Commission Recommendation on the Regulatory Treatment of Fixed and Mobile Termination Rates ('2009 EC Recommendation')[20].

The 2014 EC Recommendation

2.7 The new Commission Recommendation on relevant markets (2014/710/EU)[21] of 9 October 2014, which replaces the 2007 EC Recommendation, sets out products and services markets which, at the European level, the EC has identified as being susceptible to *ex ante* regulation. These markets are identified on the basis of the cumulative application of three criteria:

- the presence of high and non-transitory barriers to entry;
- a market structure which does not tend towards effective competition within the relevant time horizon; and
- the insufficiency of competition law alone to adequately address the market failure(s) concerned.

2.8 Together with the 2014 EC Recommendation, the Commission has adopted a revised Explanatory Note.[22]

The SMP Guidelines and their application to this review

2.9 The SMP Guidelines include guidance on market definition, assessment of SMP and SMP designation. Where relevant, we have also had regard to the revised working paper on SMP[23] published by the European Regulators Group (now replaced by

---

[18] Commission Recommendation of 9 October 2014 on relevant product and service markets within the electronic communications sector susceptible to *ex-ante* regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communication networks and services (2014/710/EU), which replaces the corresponding Commission Recommendation of 17 December 2007 (2007/879/EC), http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014H0710&from=EN

[19] Commission guidelines on market analysis and the assessment of significant market power under the Community regulatory framework for electronic communications networks and services (2002/C 165/03), 11 July 2002 ('the SMP Guidelines'), http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2002:165:0006:0031:EN:PDF

[20] Commission Recommendation of 7 May 2009 on the Regulatory Treatment of Fixed and Mobile Termination Rates in the EU (2009/396/EC), 7 May 2009 ('2009 EC Recommendation'), http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:124:0067:0074:EN:PDF

[21] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2014.295.01.0079.01.ENG

[22] See Commission Staff Working Document, Explanatory note, Accompanying document to the Commission Recommendation on Relevant Product and Service Markets within the electronic communications sector susceptible to *ex ante* regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services, 9 October 2014 ('Explanatory Note to the 2014 EC Recommendation')
http://ec.europa.eu/information_society/newsroom/cf/dae/document.cfm?action=display&doc_id=7056

[23] ERG, *Revised working paper on the SMP concept for the new regulatory framework*, September 2005,
http://berec.europa.eu/doc/publications/public_hearing_concept_smp/erg_03_09rev3_smp_common_concept.pdf

BEREC) in 2005 ('the ERG SMP Position'). In the relevant sections below we set out how we have taken the ERG SMP Position into account in reaching our conclusions.

The 2009 EC Recommendation

2.10 In 2009, the European Commission issued a Recommendation on the Regulatory Treatment of Fixed and Mobile Termination Rates[24] under Article 19(1) of the Framework Directive. This recommends that Member States adopt a common approach when setting price controls in termination markets.

2.11 The 2009 EC Recommendation favours setting regulated termination rates using a bottom-up long-run incremental cost (bottom-up LRIC) model. The Recommendation also outlines the EC's view that termination rates should be symmetrical, i.e. set at the same level between MCPs.

Forward look

2.12 Rather than just looking at the current position, market reviews look at how competitive conditions might change over the period covered by the review. For this review we have taken a forward looking view of demand, technology and costs and forecast the LRIC of MCT for each of the three years in the period covered by the review, in line with the requirement in the Directives that ordinarily a market review should be conducted within three years of the previous review.[25]

2.13 This does not preclude us from reviewing any of the markets sooner, but in the absence of unforeseen developments, we anticipate that we would time the next market review to conclude three years after the completion of the current review. We therefore conclude that the remedies in this statement will apply for a period of three years.

The June 2014 Consultation

2.14 On 4 June 2014, we published a consultation outlining our proposals for MCT regulation in 2015-2018. In particular, we proposed to:

2.14.1 Define 82 separate markets, each corresponding to an MCP able to set an MTR for calls to the UK mobile numbers allocated by Ofcom to that MCP.

2.14.2 Designate each undertaking holding UK mobile numbers as having significant market power (SMP) with respect to the (wholesale) market for terminating calls to such numbers, on the basis that the control of the number range provides the mechanism by which pricing power is exercised in relation to calls to mobile numbers. With this approach, we proposed to designate 82 MCPs with SMP.

2.14.3 Regulate the MTRs of all MCPs with SMP by imposing a single maximum cap on MTRs. This proposal represented a change from previous

[24] 2009 EC Recommendation.
[25] The 2015 MCT model involves forecasting traffic and costs for longer than the three year review period since it is based on cost recovery using economic depreciation (which is also the preferred approach to depreciation in the 2009 EC Recommendation). This approach is outlined in Section 7 and in more detail in Annex 7 of this statement.

regulation where the charge control only applied to the four largest MCPs and smaller SMPs were subject to an obligation to set MTRs at fair and reasonable terms ("F&R")

2.14.4 Impose on all MCPs an obligation to provide network access on fair and reasonable terms and an obligation of price transparency requiring all MCPs to publish their MTRs – and any proposed change to their MTRs - at least 28 days in advance of those changes coming into effect.

2.14.5 Impose an additional obligation of no undue discrimination only on the four largest MCPs in relation to the provision of network access for MCT.

2.14.6 Continue to use LRIC to set the charge control. We proposed a three-year charge control, starting from 1 April 2015 at the level set out in Table 2. We proposed to set MTRs with reference to the forecast LRIC (as determined by our MCT cost model) in each year of the charge control.

Table 2: MTRs proposed in the June 2014 Consultation (pence per minute 2012/13 prices)

	Current MTR (from 1 April 2014)	From 1 April 2015	From 1 April 2016	From 1 April 2017
Base case	0.815	0.515	0.498	0.476
Range		0.424 – 0.680	0.402 – 0.664	0.386 – 0.649

Source: 2014 MCT model

Stakeholders' responses to Consultation

2.15 We have received 14 responses to our June 2014 Consultation and one letter as part of the separate MTR enforcement programme which we regard as relevant to our policy decisions.[26] All non-confidential responses are published on the Ofcom website and the list of respondents is available in Annex 14.[27]

2.16 We have summarised the points made by stakeholders in their responses and addressed them in the relevant sections of this consultation.

Stakeholder workshops

2.17 Ahead of publishing the June 2014 Consultation, we held two stakeholder workshops.[28]

[26] Ofcom, *Own initiative enforcement programme into wholesale mobile call termination rates*, 11 November 2013, http://stakeholders.ofcom.org.uk/enforcement/competition-bulletins/open-cases/all-open-cases/cw_01115/

[27] Stakeholders responses are available at http://stakeholders.ofcom.org.uk/consultations/mobile-call-termination-14/?showResponses=true

[28] The presentations delivered during the workshops and responses from stakeholders are downloadable from http://stakeholders.ofcom.org.uk/consultations/mobilecallterm/workshop2015-2018/ and http://stakeholders.ofcom.org.uk/telecoms/policy/mobile-policy/mobile-call-termination-review-2015-2018/mct-review-2015-18-january2014/

2.18 The workshop on 23 October 2013 explained the background leading to this review, provided an indicative timeline and invited stakeholders to input into our preliminary thinking on what we considered to be the key issues for this review.

2.19 The workshop on 23 January 2014 was specific to our cost modelling of MTRs and provided stakeholders with an early opportunity to comment on the direction of the modelling.

2.20 Five companies responded in writing after our stakeholder workshop on 23 October 2013, namely, EE, Telefonica, H3G, Virgin Media and BT. In response to the January 2014 workshop, we received comments from EE, H3G and BT.

The February 2015 draft statement

2.21 On 6 February 2015, we notified our intended measures and an explanatory draft statement setting out the reasons for them to the EC, BEREC and other NRAs and we published our draft statement on the Ofcom website.[29]

2.22 On 12 February 2015, the EC requested further information regarding the notified draft statement in relation to two matters: a clarification of one revenue figure and a further explanation of our proposal to implement a one-year adjustment period for the MTR charge control. On 17 February 2015, we submitted further information on these matters to the EC.

2.23 In its decision letter of 5 March 2015, the EC made comments in relation to the entry into force of the new LRIC rates.[30] As set out in Section 8, we have taken utmost account of the EC's comments. We received no responses from BEREC or any NRAs.

Evidence-gathering process for this review

2.24 We have based our analysis on evidence gathered during this review and noted throughout the document what sources we have relied upon. The evidence includes third-party research, information gathered using our statutory powers (under section 135 of the Act) and responses received from stakeholders after the workshops noted above.

2.25 Annex 14 provides a list of the main sources of evidence used and where possible the web links where the evidence used is published online. While the annex lists the main evidence we have relied upon, the list is for convenience only and is not intended to be exhaustive.

Third-party research commissioned for this market review

2.26 We commissioned Kantar Media to carry out a consumer survey relating to consumers' awareness and use of mobile services. The survey was conducted in January and February 2014. We have used the survey results, along with other reasoning and evidence on industry trends and developments, to inform our product market definition.

---

[29] http://stakeholders.ofcom.org.uk/consultations/mobile-call-termination-14/draft-statement/
[30] http://stakeholders.ofcom.org.uk/binaries/consultations/mobile-call-termination-14/statement/UK-2015-1706_Adopted_EN.pdf

Information-gathering using statutory powers (section 135)

2.27 For this market review, we have issued notices under section 135 of the Act ('section 135 information request') requiring various MCPs to provide specified information as set out in the notices. These included:

- Notices of 8 November 2013, 14 February 2014 and 18 March 2014 sent to the four largest MCPs (EE, H3G, Telefonica and Vodafone) requesting information for our cost modelling.
- Notices sent on various dates between November 2013 and March 2014 to 93 MCPs holding mobile number ranges allocated by Ofcom. We requested information about the use of these numbers, whether MCT was offered on these numbers, the level of MTRs charged, and other information in relation to the businesses of these MCPs.
- Notice of 6 March 2014 sent to the 13 MCPs that have the largest retail customer bases.[31] We requested information in relation to on-net and off-net minutes generated and received by pre-pay and post-pay customers.
- Notices sent on various dates in September, October, and November 2014 to 79 MCPs holding mobile number ranges allocated by Ofcom to update the information received during the previous year (see above).
- Notice of 14 October 2014 sent to eight MCPs in relation to on-net and off-net minutes generated and received by pre-pay and post-pay customers. For post-pay only we requested the data be split by different levels of monthly subscription charges.
- Notices of 19 September 2014 (in order to refresh the data obtained by means of the notices of 8 November 2013, 14 February 2014 and 18 March 2014), 3 October 2014 and 4 November 2014 sent to the four largest MCPs (EE, H3G, Telefonica and Vodafone) for the purpose of finalising our cost modelling.

2.28 A more detailed list of information requests issued and the operators that responded to such requests is set out in Annex 14.

Impact assessments

2.29 The analysis presented in the June 2014 Consultation constituted an impact assessment as defined in section 7 of the Act. This statement sets out our corresponding decisions having taken all representations into account.

2.30 Impact assessments provide a valuable way of assessing different options for regulation and showing why the preferred option was chosen. They form part of best practice policy-making. This is reflected in section 7 of the Act, which means that generally we have to carry out impact assessments where our proposals would be likely to have a significant effect on businesses or the general public, or when there is a major change in Ofcom's activities. However, as a matter of policy Ofcom is committed to carrying out impact assessments in relation to the great majority of our

[31] These are the 13 MCPs with more than 50 thousands customers each and include MCPs which use number ranges allocated to other MCPs.

policy decisions. For further information about our approach to impact assessments, see the guidelines, “Better policy-making: Ofcom's approach to impact assessment”, which are on our website.[32]

Equality Impact Assessment (EIA)

2.31 Annex 6 sets out our Equality Impact Assessment (EIA) for this market review. Ofcom is required by statute to assess the potential impact of all our functions, policies, projects and practices on the following equality groups: age, disability, gender, gender reassignment, pregnancy and maternity, race, religion or belief and sexual orientation. EIAs also assist us in making sure that we are meeting our principal duty of furthering the interests of citizens and consumers regardless of their background or identity. Our June 2014 Consultation contained an EIA. We have now updated it with the latest available data on mobile voice consumption by different equality groups.

2.32 For the reasons explained in Annex 6, we do not expect any of the equality groups to be negatively affected by our decisions to a material extent. We have not seen the need to carry out separate EIAs in relation to the additional equality groups in Northern Ireland: religious belief, political opinion and dependants. This is because we anticipate that our decisions will not have a differential impact in Northern Ireland compared to consumers in general.

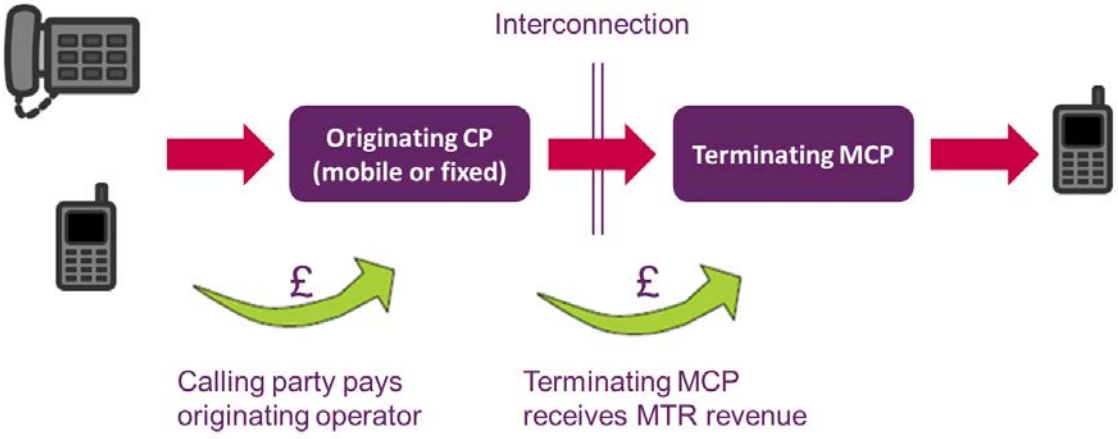
Regulation of MCT in the UK

Mobile Call Termination Rates

2.33 One of the services that network operators offering voice services provide to each other is call termination – that is, the completion of a call from a customer of another network. MCT is the service provided by an MCP necessary for an originating CP to connect a caller with the intended mobile call recipient on that MCP’s network. Under current interconnection practices used by CPs in Europe and many other countries around the world, as shown in Figure 1, the originating CP pays an amount (known as the mobile termination rate or MTR) to the MCP providing the voice call termination service.

[32] http://www.ofcom.org.uk/about/policies-and-guidelines/better-policy-making-ofcoms-approach-to-impact-assessment/

Figure 1: Mobile termination and calling network provider pays



2.34 Typically, each CP is able to set a charge for connecting calls to its own customers. Historically, as part of the EC Framework, NRAs, including Ofcom, have found that each CP has SMP with respect to call termination and have regulated fixed and mobile termination rates, typically capping them at cost-related rates.

The MCT 2011 Statement

2.35 We published our findings from the previous MCT review on 15 March 2011. We designated 32 MCPs as having SMP with respect to the termination of calls to their allocated mobile number ranges. As specified in the MCT 2011 Statement, in the UK National Telephone Numbering Plan, the mobile number ranges are numbers in the format 07xxx xxx xxx and beginning 071 to 075 and 077 to 079.

2.36 We imposed the following obligations on all 32 MCPs designated with SMP: (i) to provide MCT on fair and reasonable terms (including charges) and (ii) to publish their MTRs and to give 28 days' notice of changes to their MTRs.

2.37 We also imposed the following additional regulation on the four largest MCPs[33]: (i) a charge control for the period 1 April 2011 to 31 March 2015 where the maximum permitted charge for MCT was set based on the long run incremental cost (LRIC) standard and (ii) a condition not to unduly discriminate in relation to the provision of MCT.

2.38 The MTR cap was set on a four-year glide path and was designed to limit disruptive price-setting flexibility ('flip-flopping') by imposing a single maximum charge in each year after a two-month transition period at the start of the charge control period. The MTR cap was set at 4.18ppm in 2010/11 falling to 0.69ppm by 1 April 2014 (these being the inflation adjusted MTRs expressed in 2008/9 prices).

Modifications to the charge control in the MCT 2011 Statement

2.39 Following the publication of the MCT 2011 Statement, we made two sets of modifications to the charge control conditions set out in that statement.

[33] EE, H3G, Telefonica, and Vodafone.

2.40 On 25 October 2011, Ofcom published a notification to modify the charge control conditions in order to correct a computational error in the cost model underlying the charge control calculations.[34]

2.41 On 10 May 2012, following various appeals of the MCT 2011 Statement, we adopted certain revisions[35] to the charge control conditions, as subsequently amended, in accordance with the directions of the Competition Appeal Tribunal ('the CAT') of 8 May 2012[36], following its judgment of 3 May 2012 ('the CAT Judgment')[37]. The CAT Judgment upheld a determination of the Competition Commission ('the CC') dated 9 February 2012 ('the 2012 CC Determination')[38]. The CC upheld Ofcom's decision to adopt LRIC as the appropriate cost standard for MCT, but disagreed with certain aspects of Ofcom's analysis; agreed with BT that the glide path for reducing MTRs to LRIC should have been three years rather than four; and upheld H3G's appeal on a technical point related to the cost model.[39]

2.42 As a result of the above, the pence per minute LRIC of MCT in 2014/15 was reduced from 0.69ppm (expressed in 2008/09 prices) to 0.67ppm (in 2008/09 prices). In addition, the glide path to LRIC was determined to be steeper, in order to reach LRIC one year earlier, i.e. on 1 April 2013.

2.43 Table 3 below shows the MTR caps in real and nominal terms[40] between 2010/11 and 2014/15 following the modifications mentioned above. "TAC" refers to the Target Average Charge.

---

[34] Ofcom, *Modification of SMP conditions contained in Ofcom's Notification under section 48(1) and 79(4) of the Communications Act 2003 of 15th March 2011*, 25 October 2011, http://stakeholders.ofcom.org.uk/binaries/consultations/mtr/MCT_SMP_Modification.pdf

[35] Ofcom, *Mobile call termination, Adoption of revisions to SMP Conditions in accordance with the directions of the Competition Appeal Tribunal of 8 May 2012,* 10 May 2012 http://stakeholders.ofcom.org.uk/binaries/consultations/mtr/statement/smp_conditions.pdf

[36] British Telecommunications plc v Office of Communications (case 1180/3/3/11), Everything Everywhere Limited v Office of Communications (case 1181/3/3/11), Hutchison 3G UK Limited v Office of Communications (case 1182/3/3/11), Vodafone Limited v Office of Communications (case 1183/3/3/11) and Telefónica UK Limited ([2012] CAT 11) – order of the CAT of 8 May 2012 http://www.catribunal.org.uk/files/1180-83_MCT_Order_080512.pdf

[37] British Telecommunications plc v Office of Communications (case 1180/3/3/11), Everything Everywhere Limited v Office of Communications (case 1181/3/3/11), Hutchison 3G UK Limited v Office of Communications (case 1182/3/3/11), Vodafone Limited v Office of Communications (case 1183/3/3/11) and Telefónica UK Limited ([2012] CAT 11) – judgment of the CAT of 3 May 2012 http://www.catribunal.org.uk/files/1180-83_MCT_Judgment_030512.pdf

[38] *Reference under section 193 of the Communications Act 2003: British Telecommunications Plc v Office of Communications (Case 1180/3/3/11), Everything Everywhere Limited v Office of Communications (Case 1181/3/3/11), Hutchison 3G UK Limited v Office of Communications (Case 1182/3/3/11), Vodafone Limited v Office of Communications (Case 1183/3/3/11) and Telefónica UK Limited*. Competition Commission Determination, 9 February 2012 http://www.catribunal.org.uk/files/1.1180-83_MCT_Determination_Excised_090212.pdf

[39] EE also appealed the CAT Judgment to the Court of Appeal, which dismissed that appeal in its judgment of 6 March 2013. See Everything Everywhere Limited v Competition Commission, [2013] EWCA Civ 154, 6 March 2013. http://www.catribunal.org.uk/files/1180-83_MCT_Judgment_Of_The_CofA_060313.pdf

[40] These are the MTR caps reflecting the Retail Price Index (RPI) adjustment each year. They are available at http://stakeholders.ofcom.org.uk/consultations/mtr/statement

Table 3: Regulated MTRs (pence per minute)[41]

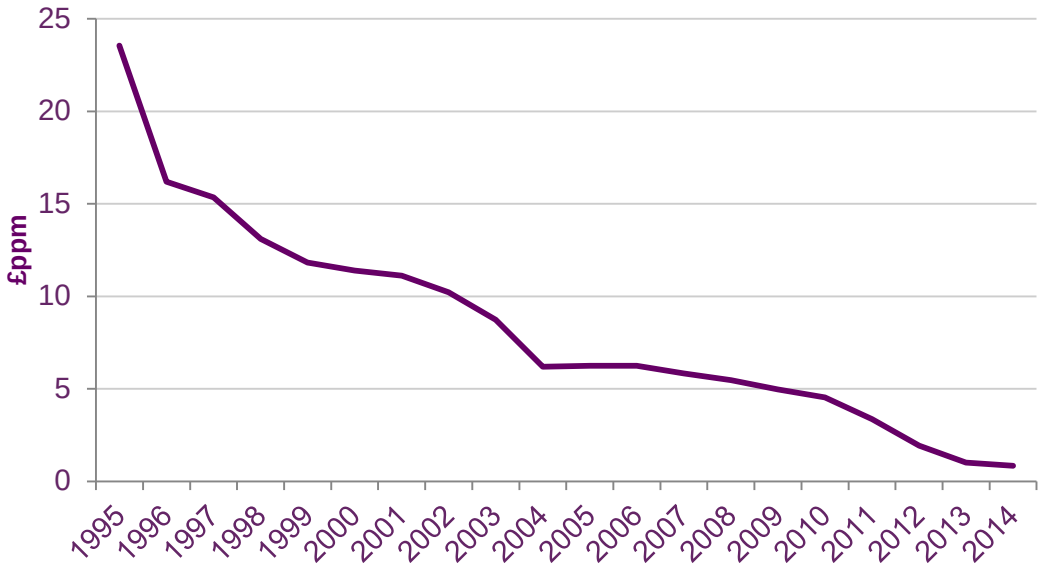
MCP	1 April 2010 to 31 March 2011 (TAC)	1 April 2011 to 30 October 2011[42]	31 Oct 2011 to 31 March 2012	1 April 2012 to 10 May 2012	11 May 2012 to 31 March 2013	1 April 2013 to 31 March 2014	1 April 2014 to 31 March 2015
Vodafone/Telefonica/EE (08/09 prices)	4.180	2.664	2.693	1.735	1.258	0.69	0.67
H3G (real 08/09 prices)	4.480	2.664	2.693	1.735	1.258	0.69	0.67
Vodafone / Telefonica / EE (nominal prices)	4.428	2.984	3.015[43]	2.053	1.5	0.848	0.845
H3G (nominal prices)	4.750	2.984	3.015	2.053	1.5	0.848	0.845
Other designated MCPs	Set on the basis of being fair and reasonable						

2.44 Figure 2 below displays the average MTR in the UK between 1995 and 2014 in nominal pence per minute (ppm). The chart shows a declining trend in MTRs, starting from 24ppm in 1995 to less than 1ppm in 2014.

2.45 The sharpest reduction in MTRs in percentage terms (although not in pence per minute terms) occurred following the last market review, where the charge control set for the years 2011-2015, as modified following the 2012 CC Determination, reduced the wholesale cap by around 80% over a three year glide-path.

[41] MTRs are also available at http://media.ofcom.org.uk/analysts/regulated-prices/
[42] Between 1 April 2011 and 31 May 2011 the rate was set on the basis of a target average charge (TAC).
[43] Price amended following the SMP modification in October 2011. See Ofcom, *Explanatory Note accompanying Ofcom's Modification of the Mobile Call Termination SMP Conditions*, 25 October 2011. http://stakeholders.ofcom.org.uk/binaries/consultations/mtr/MCT_SMP_Modification-note.pdf

Figure 2: Average MTR in the UK (nominal pence per minute, weighted by subscriber numbers)



Regulation of fixed termination rates (FTRs)

2.46 By way of background, we also note that in September 2013 we concluded our review of the fixed narrowband services markets ('2013 FNMR'), including wholesale fixed geographic call termination.[44] In the statement published in September 2013 ('the 2013 FNMR Statement'), among other remedies, we imposed a charge control on the fixed termination rates (FTRs) charged by BT and based this on the LRIC of fixed geographic call termination. Prior to our review in 2013, regulated FTRs were set on the basis of LRIC+.[45]

2.47 Other CPs that were also found to have SMP in their relevant fixed geographic call termination markets were not made subject to a charge control, but are subject to an obligation to provide network access on reasonable request and on fair and reasonable terms, conditions and charges.[46]

Regulation of MTRs in Europe

2.48 Our review concerns the markets for MCT in the UK and as such is based on the specific national circumstances that characterise these markets. However, since this review is conducted under our duties within the European Framework, we include here some information about regulation of MCT in other European countries.

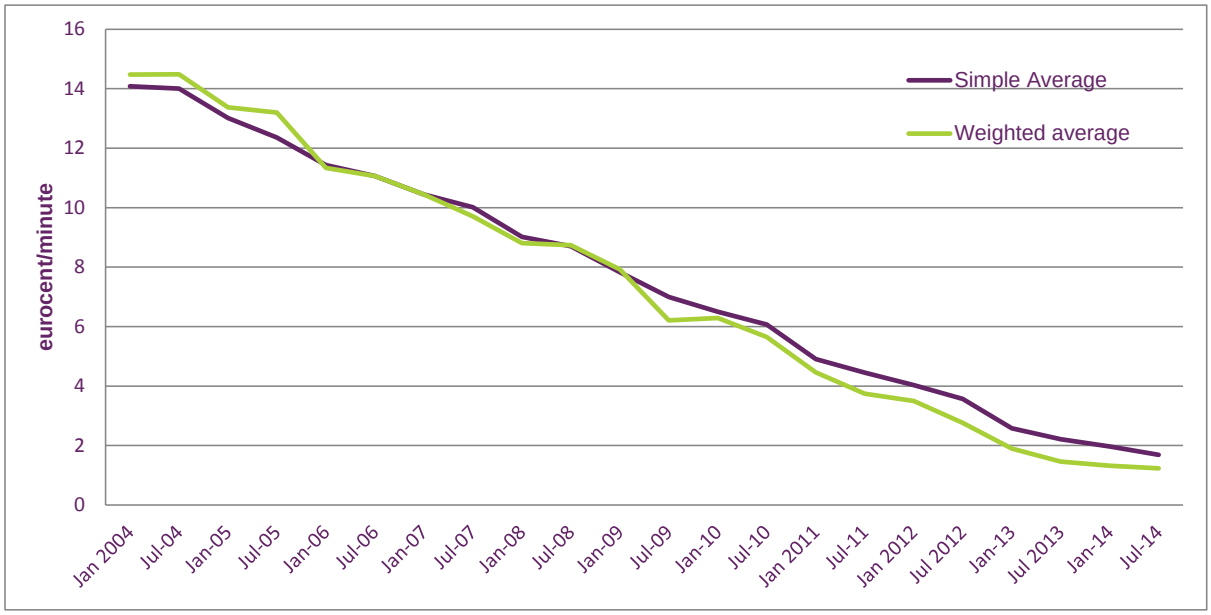
[44] Ofcom, *Review of the fixed narrowband services markets, Statement on the proposed markets, market power determinations and* remedies, statement, 26 September 2013. http://stakeholders.ofcom.org.uk/binaries/consultations/nmr-2013/statement/Final_Statement.pdf
[45] Historic FTRs were set using CCA FAC (current cost accounting fully allocated costs), which we consider to be broadly equivalent to LRIC+.
[46] See paragraphs 6.125-6.135 of the 2013 FNMR Statement.

2.49 According to the latest European benchmark[47], the simple average MTR in Europe stands at 1.69 € cents per minute, and the weighted average is estimated at 1.23 € cents per minute.[48]

2.50 As with the trend identified in the UK, the average MTR in Europe has declined significantly in the last ten years from about 14 € cents per minute to less than 2 € cents per minute, as shown in Figure 3 below.

2.51 We have also considered the cost standards used by other European countries. Among the major European NRAs that started reviews of MCT after the 2009 EC Recommendation was published, almost all have adopted, or will soon adopt, LRIC-based MTRs.

Figure 3: Average MTRs in Europe - time series (32 countries)



Background on the current provision of MCT

2.52 The following paragraphs provide some further background to our review in relation to the latest developments in the provision of MCT. More specifically, to inform our market definition we first recap on the current technical solutions to deliver a voice call over a mobile network. We then describe the companies in the MCT markets and the most recent trends in mobile networks.

---

[47] BEREC, *Termination Rates Benchmark Snapshot (as of July 2014): Integrated Report on Mobile Termination Rates, and SMS Termination Rates*, 4 December 2014. http://berec.europa.eu/eng/document_register/subject_matter/berec/reports/4794-termination-rates-benchmark-snapshot-as-of-july-2014-integrated-report-on-mobile-termination-rates-amp-sms-termination-rates

[48] Average MTRs per country have been obtained by weighting the average MTR of each MCP by its market share, measured in terms of subscribers (by subscribers we understand that BEREC is weighting by what we would term subscriptions). Two European averages have been calculated: a simple average and a weighted average, the latter weighting each country's MTR with the share of that country's subscribers (i.e. total subscribers per country / total European subscribers). In the case of the European weighted average, only the countries that reported the number of subscribers are taken into account.

How voice calls are delivered

2.53 There are many ways to deliver voice calls to a mobile handset as handsets are increasingly becoming capable of making or receiving voice calls through various radio technologies. Below we describe the typical architecture used to carry voice calls over mobile networks and how this differs in the case of over the top and hybrid voice services. The network architecture is described at a high level, together with examples of the call path through the voice network.

2.54 Traditionally voice calls have been carried over public switched telephone networks (PSTNs) using circuit switched (CS) networks.[49] In CS networks the communication takes place over a dedicated circuit and as such the call quality can be fully controlled. Recently, some MCPs have started using packet switched (PS) networks to carry voice. PS networks differ from CS networks in that they group all transmitted data – regardless of content, type, or structure – into suitably sized blocks, called packets, which are routed independently of their respective destinations. This means that in a PS-based voice call there is no single dedicated network path reserved for the call but, instead, various paths can be used in parallel while other services such as video or data may be carried over the same paths. A PS voice call is typically carried over Internet Protocol (IP) and is typically referred to as a Voice over IP (VoIP) call.

2.55 When a PS voice call is used by MCPs on managed networks the quality of service (QoS) of the voice can be controlled. However, a PS call, in the form of VoIP, can also be delivered through an over the top (OTT) service whereby the voice packets are carried over an existing data connection provided by a third party. Typically the underlying data network will provide no prioritisation for the OTT voice packets relative to other data packets and so the OTT voice QoS cannot be guaranteed.

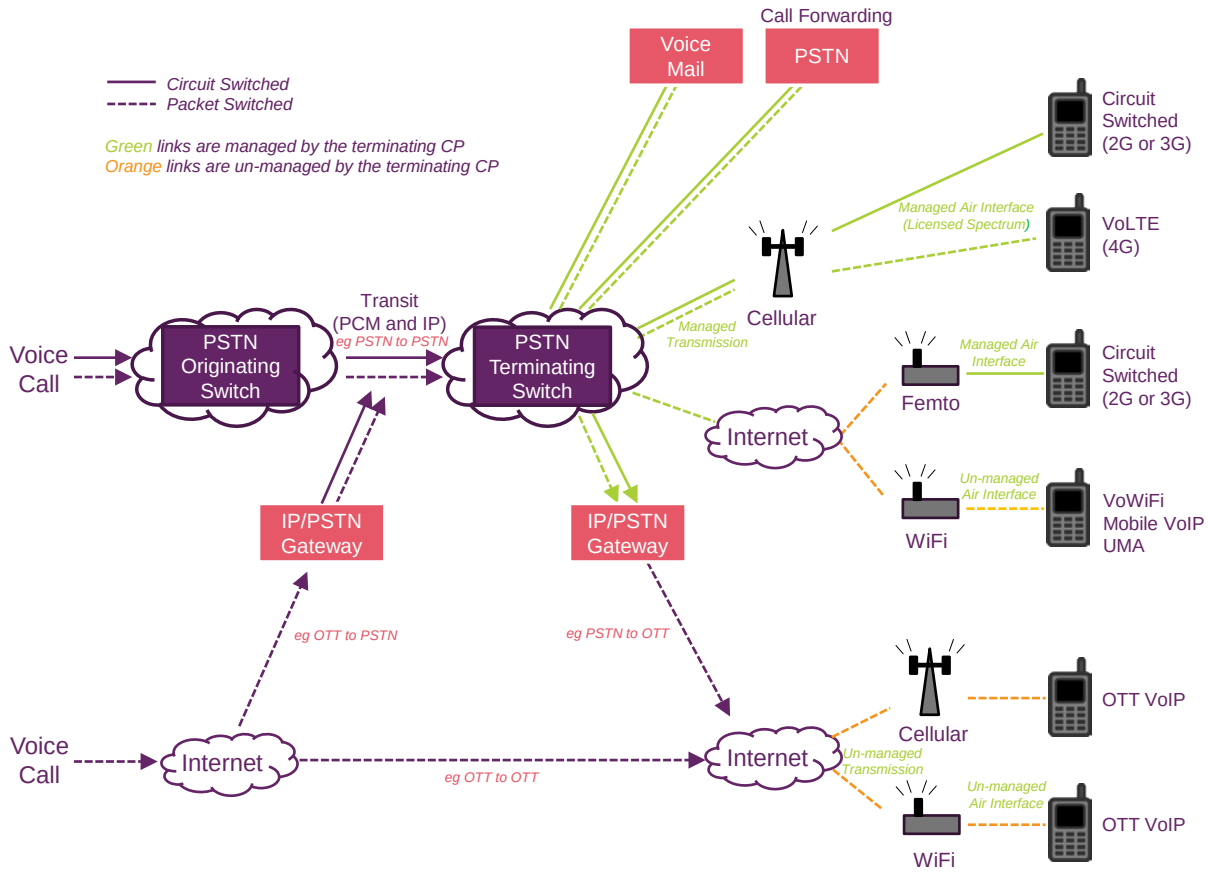
2.56 Typically 2G and 3G technologies carry voice calls over a CS network, however 4G is a PS-only network which does not intrinsically support CS calls.[50] Currently MCPs are using circuit switched fall back (CSFB) where handsets are instructed to switch from 4G to 3G or 2G when making or receiving voice calls. We expect some MCPs to carry voice over 4G using the technology of Voice over LTE (VoLTE) during the period covered by this market review. Other technologies such as VoWiFi allow MCPs to originate and/or terminate calls over WiFi, in which case they do not use a 2G, 3G, or 4G Radio Access Network (RAN).

2.57 Figure 4 shows a simplified view of the call paths in both traditional PSTN networks and OTT services. We note that an MTR is levied when a call is routed via a PSTN terminating switch.

[49] A Public Switched Telephone Network (PSTN) refers to a telephony network used to provide telephone calls using (or emulating) circuit-switching and using telephone numbers to identify subscribers or called locations, allowing all customers connected to the network to call all other customers. A PSTN can be either a fixed or a mobile network.

[50] 4G can be used to indicate technologies such as LTE and WiMAX, however LTE is the predominant 4G technology used in the UK. As such, where 4G is referred to in this document, we mean LTE unless otherwise specified.

Figure 4: Simplified PSTN and OTT Architecture



Calls originating on a PSTN and terminating on a PSTN mobile network

2.58 Calls originating on a PSTN and terminating on a mobile PSTN are terminated to a mobile number allocated by Ofcom. [51] They are typically carried as CS calls although networks may interconnect by using PS technology. The terminating switch can route the call to the called party's handset in a number of ways, described below, while in some cases it is possible that more than one technology is used during a voice call as the recipient moves between areas covered by different technologies. For all these types of calls (which are to a UK mobile number), the terminating MCP charges an MTR.

- *Over a traditional cellular network to a mobile handset with a SIM card.*

  If the destination handset is attached via a SIM card to the terminating MCP's cellular network then the voice call can be routed over the cellular network. Typically the network links used for terminating these calls will be fully managed by the CP at all times.

[51] Note that not all mobile numbers are allocated for use in the UK. Some are allocated to MCPs providing services to customers in the Channel Islands and Isle of Man.

- *Over the internet via a femtocell to a mobile handset with a SIM card.* [52]

  In this situation the network between the terminating MCP and the femtocell may not be managed by the terminating MCP so it may not be possible to fully control the QoS of the voice call.

- *Over the internet via VoWiFi to a mobile handset with a SIM card.*

  VoWiFi delivers voice calls over WiFi connectivity is available. Similar to the femtocell scenario above, the MCP may not be able to fully control the QoS of the voice call when the call is delivered over a broadband network not directly managed by the same MCP.

- *Over the internet to a mobile handset with a SIM card using UMA.*

  Unlicensed mobile access (UMA)[53] is a mobile technology that can be used to deliver a voice call over an IP connection using unlicensed (e.g. WiFi) spectrum.

- *Over the internet to a mobile handset using an application.*

  MNOs may offer an application for use on smartphones and tablets in which the application receives a voice call if the device is connected to the internet, for example over WiFi. In this situation the call is made to a mobile number and the terminating switch directs the call over the internet as an OTT service. An example is the Telefonica TU Go service.[54]

- *By forwarding to another PSTN or to a voice mail platform.*

  We discuss these services and how their costs of provision relate to mobile call termination in paragraphs 3.105-3.110 and 5.123-5.124.

Calls originating from the internet and terminating on a PSTN mobile network

2.59 VoIP calls originating from the internet and terminating on a PSTN mobile network are known as 'VoIP Out' services and can be terminated to a UK mobile number allocated by Ofcom. Examples of these services include Skype calls to mobile numbers, BT's SmartTalk, and various SIP based applications.[55] These calls are carried as OTT VoIP until they reach an IP/PSTN gateway from where they are carried as a PSTN managed voice call to the terminating switch. The terminating PSTN switch can terminate the call in any of the ways described above. For this type of calls (which are to a UK mobile number), the terminating MCP charges an MTR.

Calls carried over the Internet not involving a UK mobile number (pure-OTT)

2.60 VoIP calls originating from the internet and terminating via the internet are known as OTT VoIP services. Such calls are not terminated to a UK mobile number allocated

[52] A femtocell is a small low power cellular base station. Femtocells are typically used inside buildings and are connected to a broadband line.
[53] UMA is a commercial name for Generic Access Network (GAN).
[54] See http://www.o2.co.uk/apps/tu-go.
[55] Session Initiation Protocol (SIP) is a signalling protocol that is commonly used for calls over IP networks.

by Ofcom and as such we are not aware of them incurring a termination rate. We refer to these services later in the document as 'pure-OTT' to indicate that they are exclusively carried over the Internet and do not use any telephone number. The whole voice path is OTT via third party IP providers and so, as with any OTT service, the call quality cannot be fully managed or guaranteed. Examples of these services include Skype over the Internet, Viber and Facetime.

Calls originating on a PSTN and terminating via the Internet.

2.61 'VoIP In' refers to services which allow voice calls originating on a PSTN to be received via VoIP over the Internet. Such calls will pass to a PSTN terminating switch and from there to a PSTN/IP gateway where they are converted to OTT VoIP. Examples of these services include Skype and various SIP based applications. The call is routed to the terminating switch by using a telephone number and either a fixed or mobile termination rate may apply depending on the type of number used.

Companies in the MCT markets

2.62 There are four MCPs with widespread national radio access networks (RAN), who have independent control of spectrum, and operate in both the wholesale and retail markets. We refer to these MCPs (EE, Vodafone, Telefonica and H3G) as the 'four largest MCPs'.

2.63 There are also a large number of smaller MCPs (of varying size and scope) that provide various types of mobile communications services using mobile number ranges allocated to them, but are not of the same size and scope as the four largest MCPs. Whilst some MCPs are combining infrastructure roll-out and roaming arrangements to achieve near national coverage, others have chosen to target specific geographic areas.[56]

2.64 We refer to MCPs using OTT to terminate calls to their mobile numbers as *asset-light* MCPs. By this we mean that these are MCPs who provide MCT without using the full technological infrastructure used by traditional MCPs, such as the four largest MCPs. Asset-light MCPs would not operate, or themselves directly incur the costs of operating, a radio access network.

Network Trends

2.65 Mobile network technology is developing rapidly, and this is having the effect of enabling mobile networks to carry ever increasing volumes of data whilst reducing the cost of carrying each "bit" of information. Key network-related trends are summarised below.

[56] Some MCPs are often referred to as mobile virtual network operators (MVNOs), e.g. Tesco, Virgin Media, Asda, and GiffGaff. Typically MVNOs do not operate their own RAN but rely on that of one of the four largest MCPs, but there is no generally accepted definition of an MVNO. Not all MVNOs have their own allocation of UK mobile numbers and some MVNOs act as resellers of services provided by other MCPs on UK mobile numbers allocated to those other MCPs.

4G and spectrum liberalisation

2.66 Following the auction in 2013 for 4G spectrum at 800 MHz and 2.6 GHz, five MCPs obtained spectrum.[57] Use of 4G and the additional spectrum enables MCPs to provide more data capacity and higher data rates to 4G devices, including mobile handsets.

2.67 Spectrum liberalisation has enabled MCPs to refarm spectrum from 2G to 3G and 4G. This enables spectrum to be used for spectrally more efficient technologies, better suited to the growth in data demand. For example, spectrum that was previously used solely for 2G at 1800 MHz can now also be used for 4G.

Voice calls

2.68 Voice calls have traditionally been delivered using circuit-switched technology, which requires network infrastructure designed to open and maintain a continuous connection between the caller and the recipient during the call. However, as noted above, there has been a growth in new methods of delivering a call, such as VoIP, which do not use a 2G/3G circuit-switched mobile network.

2.69 As noted in paragraph 2.56, currently MCPs are using CSFB to carry voice from or to 4G handsets over circuit switched 3G and 2G. However, we expect that MCPs will increasingly carry voice over 4G using VoLTE, which can result in a more efficient use of spectrum. Other technologies, such as VoWiFi, allow MCPs to deliver PS voice calls over a third party's data infrastructure.

Radio Access Network (RAN) sharing

2.70 RAN sharing continues to be a significant trend in the sector due to the large cost savings available (the RAN is typically the largest network cost). Today there are two national RAN sharing agreements: EE and H3G share their RANs through the joint venture company Mobile Broadband Network Ltd (MBNL)[58], and Vodafone and Telefonica share their RANs through the joint venture company Cornerstone Telecommunications Infrastructure Ltd (CTIL).[59]

Small cells

2.71 There has been an increase in the use of 3G small cells, of which the greatest use has been of low power indoor femtocells. These have typically been deployed to provide in-building residential coverage where coverage may otherwise be poor.

---

[57] More information regarding the outcome of the 2013 spectrum auction can be found at http://media.ofcom.org.uk/2013/02/20/ofcom-announces-winners-of-the-4g-mobile-auction/

[58] The agreement between EE and Three via the MBNL joint venture provides for 3G active sharing and 4G passive sharing (only sites and backhaul).

[59] In the CTIL joint venture also known as Project Beacon, the UK is split into two regions of about the same size: the West of England and Wales (Vodafone), East England, Scotland, and Northern Ireland (Telefonica). Each MCP takes responsibility for the design, management and maintenance of radio equipment and local transmission networks in its designated region while renting the network in the other region. The agreement covers all technologies (2G, 3G, 4G), except in London where each MCP deploys and maintains its own 2G and 3G network. The sharing does not include spectrum, fibre backbone network, or any of their service provision.

Section 3

Product and geographic market definition

Summary

3.1 This section sets out our analysis and decisions for the product and geographic market definition. The market definition forms the basis for identifying any SMP and the appropriate remedies, as discussed in subsequent sections of this document.

3.2 We conclude that we should adopt the following market definition:

"termination services that are provided by [named mobile communications provider] (MCP) to another communications provider, for the termination of voice calls to UK mobile numbers[60] allocated to that MCP by Ofcom in the area served by that MCP and for which that MCP is able to set the termination rate."

3.3 Based on the above definition, we have identified a total of 72 separate markets for wholesale MCT services, corresponding to each of the 68 smaller MCPs and the four largest MCPs.

3.4 This is the same as the market definition that was proposed in our June 2014 Consultation, and is in line with the market definition in our MCT 2011 Statement, although the number of MCPs providing MCT has changed.[61] This market definition is also consistent with the approach taken in the 2013 FNMR when assessing the markets for fixed geographic call termination services.

3.5 12 stakeholders provided comments on our proposals on market definition. H3G, BT, a smaller MCP, and the Communications Consumer Panel all agreed with Ofcom's proposed product market definition. EE and Vodafone considered that Ofcom had not taken sufficient account of the constraint from OTT services, nor assessed that constraint in the correct way. Three respondents [✂] argued that the termination of calls to the UK mobile numbers that they hold should be excluded from regulation because of the nature of the service that they provide. One provider based in the Channel Islands suggested that it should not be subject to regulation by Ofcom; the Communications Commission of the Isle of Man and Manx Telecom Trading Ltd ('Manx Telecom') also argued that Manx Telecom should be excluded from Ofcom's review.

3.6 We discuss our reasoning and address stakeholder comments in the relevant sections below:

- Regulatory and analytical framework
- Starting points for product market definition

[60] These are the numbers included in the number ranges designated for "mobile services", as defined in the National Telephone Numbering Plan. In the current Numbering Plan, these are numbers in the format 07xxx xxx xxx and beginning 071 to 075 and 077 to 079.
[61] In the June 2014 Consultation we identified a total of 82 separate markets for wholesale MCT services, comprising 78 smaller MCPs and the four largest MCPs.

- Retail services
- Wholesale services
- Widening and clarifying the product market definition
- Geographic market definition
- Conclusion on market definition

Regulatory and analytical framework

3.7 The legal framework for our market definition requires that we identify the markets that in our opinion are appropriate, in the circumstances of the UK. It requires that we do so in accordance with competition law principles.[62] In so doing, we must take due account of the 2014 EC Recommendation and the SMP Guidelines.[63] We discuss the legal framework for market definition in more detail in Annex 2.

3.8 In our June 2014 Consultation, we proposed a market definition based on mobile number ranges, in line with that adopted in the MCT 2011 Statement. This approach to market definition is also consistent with the approach taken in the 2013 FNMR Statement when assessing the markets for fixed geographic call termination services.[64]

3.9 The 2014 EC Recommendation identifies those product and service markets in which *ex ante* regulation may be warranted, including wholesale "voice call termination on individual mobile networks".[65] Consistency with this Recommendation is discussed in paragraphs 3.59 and 3.124 later in this section.

3.10 As required by the EC's Framework, we conduct market definition using a 'modified Greenfield approach'.[66] This requires us to conduct the market definition and SMP assessment while imagining that all SMP regulation is absent, from the supply chain at the same level as the input being assessed or further downstream from it. For MCT this means that we disregard the effects of SMP remedies that restrict the provision and pricing of MCT.[67] The analysis also needs to be forward-looking. Therefore, we evaluate the expected and foreseeable technological and economic developments likely to affect mobile markets.

3.11 A detailed description of the market definition exercise is given in Annex 2. In summary, market definition begins with a narrowly defined focal product, and adds to the market all demand and supply-side substitutes a hypothetical monopolist would need to control before it could profitably raise prices by a small but significant non-

---

[62] Section 79(1) of the Act; Article 15(3) of the Framework Directive.
[63] Section 79(2) of the Act; Article 15(3) of the Framework Directive.
[64] "termination services that are provided by [named fixed communications provider] (CP) to another communications provider, for the termination of voice calls to United Kingdom geographic numbers in the area served by that CP." Here, wholesale fixed geographic call termination relates to the conveyance of all signals (including relevant control signals) required to terminate calls on a customer's exchange line, from the point in the network closest to the end customer's point of connection, to the point in the network where those signals can be accessed by another CP.
[65] Market 2, 2014 EC Recommendation.
[66] See Explanatory Note to the 2014 EC Recommendation.
[67] We further discuss the modified Greenfield approach in Section 4, paragraphs 4.15-4.16.

transitory amount (SSNIP), usually 5-10%.[68] It is often difficult to calculate the impact of a SSNIP precisely, but the test nonetheless provides a useful conceptual framework. We have used this framework to define both product and geographic markets. We have also considered whether product and geographic markets may be aggregated further, on the basis that they are subject to the same conditions of competition.

3.12 The 2014 EC Recommendation identifies the starting point for the overall assessment of wholesale markets to be the assessment of the relevant retail markets from a forward-looking perspective, taking into account demand-side and supply-side substitutability.[69] This is because demand for wholesale products is derived from the retail market and will be affected by the characteristics of it. This means that, in addition to "direct" constraints due to substitution at the wholesale level, we need to consider "indirect" constraints from the retail market. Indirect constraints arise because wholesale price rises may be passed through to the retail market, causing retail consumers to switch away, and therefore lowering wholesale volumes. Such indirect constraints might lead to products being included in the same relevant market even if those products do not constrain each other directly at the wholesale level.

Starting points for market definition

3.13 In this section we consider what the starting point (or focal product) for our market definition exercise should be. We first consider retail services and then consider wholesale services.

The starting point for analysis of retail services

3.14 In the June 2014 Consultation, in relation to retail services, we proposed that our starting point should be a voice call initiated by the calling party to the called party's mobile number (that is, to numbers beginning 071 to 075 and 077 to 079).[70] Each distinct mobile number therefore constitutes a separate focal product.

3.15 Our set of focal products included calls to all UK mobile numbers which are active, or which we expect to be active, over the period of the review, regardless of the technology used. Services that establish voice calls between two users using data connections, but do not use mobile telephone numbers ('pure-OTT' services), were excluded because they do not attract a termination rate. However, for the avoidance of doubt, calls which are initiated on pure-OTT applications, such as 'Skype Out', but terminate on mobile numbers are included within our set of focal products. In addition, calls to a UK mobile number allocated to an asset-light MCP (i.e. an MCP using OTT in order to terminate calls to its mobile numbers), for which it can set a

[68] See Annex 2 for more detail.
[69] See Recital 7 of the 2014 EC Recommendation.
[70] Under the National Telephone Numbering Plan, we have designated specific number ranges for mobile services. These are those numbers beginning 071 to 075 and 077 to 079 (070 numbering is designated for personal numbering and 076 for radio paging). The plan defines a mobile service as:"...a service consisting in the conveyance of Signals, by means of an Electronic Communications Network, where every Signal that is conveyed thereby has been, or is to be, conveyed through the agency of Wireless Telegraphy to or from Apparatus designed or adapted to be capable of being used while in motion." See Ofcom, *The National Telephone Numbering Plan*, 11 December 2014 http://stakeholders.ofcom.org.uk/binaries/telecoms/numbering/Numbering_Plan_Dec_2013.pdf

termination rate, are included in our market definition. No stakeholder disagreed with these proposals and we have taken the same approach in this statement.

3.16 Some smaller MCPs (see Annex 4) use their number ranges to provide services that forward calls from or to international destinations. We received some consultation responses relating to these services, which we discuss later in this section (paragraphs 3.105-3.110). We include these services in our set of focal products, primarily because they involve the use of UK mobile numbers and an MTR is charged for calls to these numbers.

3.17 Our set of focal products excludes calls to UK mobile number ranges allocated to MCPs based in the Channel Islands and the Isle of Man where their MTRs are already subject to regulation imposed by their respective national regulatory authorities. As the purpose of our market definition is ultimately to allow us to assess market power and to determine whether *ex ante* regulation is necessary[71], we do not consider it appropriate to include calls to UK mobile numbers allocated to MCPs whose MTRs are already regulated.[72] We include all other calls to UK mobile numbers held by any other foreign-based MCPs that provide MCT services.

3.18 In our June 2014 Consultation we proposed to include calls to UK mobile numbers allocated to three companies based in the Channel Islands and the Isle of Man which we understood were not licensed to provide mobile services in those territories or for which the MTRs appeared not to be subject to local regulation.[73] In response to the June 2014 Consultation, Manx Telecom and the Isle of Man Communications Commission argued that we should not regulate Manx Telecom's MTRs because they are already subject to local regulation[74]. Marathon Telecom Ltd ("Marathon"), which is registered in Jersey, argued that we should not regulate its MTRs because the rate does not exceed that set by its local regulator (even though Marathon's licence does not restrict its MTR in this way). They also said that Marathon should not be treated any differently to other local operators.

3.19 In relation to Manx Telecom, we have decided to exclude the calls to the UK mobile number ranges allocated to this MCP because we understand from further information provided by its local regulator that Manx Telecom's MTRs are subject to local regulation. In relation to Marathon, our understanding is that the communication regulator in the Channel Islands has just initiated a review of the MCT market in Jersey and Guernsey and it intends to consider regulating Marathon's MTRs as part of this review. On this basis, we do not consider it necessary to include calls to UK number ranges allocated to Marathon in our relevant MCT markets.

---

[71] Even if MCPs such as JT (Jersey) Ltd were included in our market definition we do not consider that we would be likely to find SMP or, alternatively, likely harm arising from SMP. This is because under the modified Greenfield approach our subsequent market power assessment would have to take into account regulation in the Channel Islands and Isle of Man. As those MCPs' MTRs are regulated under their licence obligations this does not suggest they would be able to price their MCT services independently of their competitors.

[72] The 7 MCPs we have excluded are: Guernsey Airtel Ltd, Jersey Airtel Ltd, JT (Guernsey) Ltd, JT (Jersey) Ltd, Sure (Guernsey) Ltd, Sure (Isle of Man) Ltd and Sure (Jersey) Ltd.

[73] The three companies are Globecom International Ltd, Manx Telecom Trading Ltd, and Marathon Telecom Ltd.

[74] They also added that Manx had agreed with the Isle of Man Communications Commission to align its MTRs with the rates set by its local regulator in relation to a couple of legacy number ranges.

3.20 Our starting point for the analysis of the retail market is therefore a voice call initiated by the calling party to the called party's UK mobile number. This includes all calls to UK mobile numbers that are active, or which we expect to be active, within the review period, including those that are used to provide call forwarding services. This is regardless of the technology employed to terminate the call to that mobile number. This is also irrespective of how the call may be originated (i.e. on another mobile handset, by fixed line telephony, or by an OTT app) or which company the mobile number is allocated to (excluding, however, calls to UK mobile numbers held by MCPs holding a mobile operator licence issued by the Channel Islands or Isle of Man authorities and whose MTRs are subject to regulation by the local regulatory authorities).

The starting point for analysis of wholesale services

3.21 In the June 2014 Consultation, we proposed the following starting point for our analysis of the wholesale market: *"wholesale mobile call termination services that are provided by each MCP, for calls to a mobile number allocated by Ofcom to that MCP and for which that MCP is able to set the termination rate",* where this takes place in order to complete retail calls of the type described above. We received no comments on this proposal and our view remains that this is the appropriate starting point.

3.22 As in the June 2014 Consultation, we note that the underlying control of wholesale call termination ultimately rests with the CP that controls the number range, rather than with the CP that physically hosts the termination service, if these differ. We note that a number range holder may not control its own access network and may choose to purchase some or all of the network elements required to physically terminate the call. In mobile markets, the relationship between a number range holder and the CP providing the underlying network elements (the 'hosting CP') may extend to enabling the hosting CP to conclude termination agreements for all of the numbers of the number range holder on its behalf. In this case, an originating CP would have no direct commercial relationship with the number range holder.

3.23 As part of our information gathering process, we assessed what proportion of smaller MCPs rely on hosting providers and in such cases a) how MTRs are set and agreed; and b) what proportion of MTR revenues are received by the MCP holding the MNR. Around one third of the 68 smaller MCPs have their MNRs hosted on a third-party network. Of these, the majority of those that responded to our information request told us that MTRs are either set unilaterally by the MCP in question or agreed bilaterally through commercial negotiations. Only five companies reported that MTRs are decided and set unilaterally by BT.[75] However, our understanding is that BT does not set the MTRs on behalf of MCPs. BT acts as the transit provider and we expect MCPs to be able to agree with BT to interconnect at a rate of their choosing (albeit that this may be within the suite of termination rates already on the BT Carrier Price List – many of which we note are considerably above the benchmark MTR).

3.24 We therefore conclude that the underlying control of wholesale call termination ultimately rests on control of the number range; hosted numbers may be moved between different hosting networks or, ultimately, a number range holder may move the numbers onto its own network. The intervention of a hosting CP can only occur with the authorisation of the number range holder and consequently wholesale call termination cannot occur without, directly or indirectly, the involvement of the number

[75] [✂]

range holder. Therefore, we consider that the control of the number range, rather than the hosting of the termination service, is the key element to controlling the wholesale call termination service.

Retail services

Summary of our consultation document and stakeholder comments

3.25 In our June 2014 Consultation, our retail assessment focused mostly on callers to mobile numbers, rather than call recipients. This is because, under the "calling party pays" (CPP) system which operates in the UK, the calling party pays the full price of a call and thus has the greatest incentive to react to price increases.

3.26 Our proposal in relation to the retail market was that there are no indirect constraints from the retail level on the wholesale market as the current alternative forms of communication services are unlikely to constrain the pricing of calls to mobiles. We reached this provisional conclusion for the following reasons. Firstly, consumers are unlikely to be aware what network they are calling and the price of that call. Therefore, if the price of calls to a specific number were to rise by a small but significant amount, it would not be likely to prompt a reaction. Secondly, even if awareness were not an issue, we did not think that, during the period of this market review there will emerge sufficiently strong substitutes to constrain the pricing of calls to mobile numbers, whether these substitution possibilities are assessed individually or collectively. We also saw no feasible opportunities for supply-side substitution.

3.27 While H3G, BT, Virgin and the Communication Consumer Panel agreed with Ofcom's retail market definition, EE and Vodafone submitted that Ofcom had not given due weight to the constraint from alternatives including OTT services. They told us that they think the importance of the constraint from OTT services will grow over time. BT and Virgin also emphasised that the market is changing over time.

3.28 More generally, EE also argued that Ofcom's analysis did not focus sufficiently on that section of consumers most likely to switch in response to a price rise (known as marginal consumers) as opposed to consumers in general. EE submitted that Ofcom should conduct critical loss analysis which considers what quantity of switching would render a SSNIP in MTRs unprofitable, and carry out further survey work to assess what proportion of users would switch in response to a SSNIP. EE also said that our analysis was not sufficiently forward-looking.

3.29 In our assessment of the retail market we consider:

- the effect of increases in MTRs on retail prices;
- issues relating to caller awareness of a retail price rise;
- the alternative services that are available to callers of mobile numbers, including[76]

[76] Another way in which callers may react to an MCP increasing its wholesale MTR is to move to that MCP's network, thus providing a strategic motive for increased MTRs. For example, if MCP A unilaterally raised its MTR, other MCPs (B, C and D) would need to put their retail prices up to cover the increased MTRs of MCP A. Subscribers on the networks of MCP B, C or D would potentially find

- calls to a fixed line as a substitute for calls to a mobile;[77]
- on-net mobile to mobile (M2M) calls as a substitute for off-net calls;
- call-back arrangements;
- the use of 'pure-OTT' services that by-pass a mobile number, by delivering a voice service via an application on a mobile handset over a data connection; and
- SMS, email, instant messaging and social networking sites.

- the overall impact of these substitutes, and the potential reactions by call recipients to retail price increases; and
- the possibility of supply-side substitution.

The effect of MTR price rises on retail prices

3.30 Even if a 5-10% MTR increase by all MCPs were fully passed through into retail prices, the resulting percentage increase in retail prices would be much smaller. This is because MTRs make up only a fraction of the underlying costs of calls, and an even smaller fraction of the cost of bundles that include calls, texts, and/or data. For customers that face a standard call price across multiple operators, the effect on retail prices from a single MCP raising its MTRs would be even smaller, since across MCPs, the largest market share is less than a third.

Reaction by callers – awareness of a price rise

3.31 For callers to react to an increase in the price of calls to a specific mobile number they must be sufficiently aware of that increase to act upon it. In particular, consumers need to be: aware that they are calling a mobile number; aware of the specific network/call provider that controls the number; and aware of the price they would face when calling that particular network/mobile number. In line with the research findings in our 2011 review,[78] the market research we conducted in February 2014[79] suggests that these conditions will rarely be met:

MCP A more attractive due to this impact on retail call prices. We do not, however, believe that this provides a relevant competitive constraint to pricing power in setting MTRs. Indeed, it reinforces our view that there is an incentive to increase MTRs absent regulation.

[77] In our previous review we also considered substitution between M2M and F2M calls in response to an MTR increase. However, we noted that the MCP controls both termination rates, so it can limit the impact of this substitution on the profitability of a SSNIP. The exception would be where the M2M call was on-net which we discuss in paragraphs 3.37-3.39.

[78] For example, the Jigsaw research commissioned in the previous review showed that 87% of respondents knew when they were calling a mobile number however only 24% suggested that they knew to which network this number is allocated. Even for the numbers respondents called most often, less than half (45%) suggested that they knew which MCPs these numbers were associated with. Fewer than a third of respondents in the Jigsaw research (30%) had any idea of the price of calling other MCPs, and only 7% stated that they knew it exactly. See: Jigsaw Research, *Mobile Calling Patterns Research*, http://stakeholders.ofcom.org.uk/binaries/consultations/mobilecallterm/annexes/annex10_2.pdf

[79] Kantar Media carried out the research in February 2014 using telephone interviews for a total base of 2069 respondents. See Annex 18 of our June 2014 Consultation.

- around three quarters (72% of respondents with a landline and 75% of respondents with a mobile phone) said they always or frequently had good awareness of whether they were calling a mobile or a landline; but

- the majority of those with a landline or mobile phone (69%) answered that they rarely or never knew which mobile network they were calling; and

- the majority of those with a landline or mobile phone (54%) had only a rough or vague idea of the cost of making a call to a mobile, and 35% had no idea.

3.32 This suggests that, overall, consumers would have limited awareness of retail price changes that might result from the impact that an increase in MTRs might have at the retail level. Our view is that as a result, consumers may be unlikely to respond by substituting away from mobile calls.

Calls to fixed lines as a substitute for calls to mobiles

3.33 If a caller tries to contact a mobile user and expects that user to be in reach of a known landline (e.g. at work or home) then, in principle, the caller might call the fixed line as a substitute for a call to a mobile number. However, as in our previous review, we consider that calls to fixed lines are not in general a close enough substitute for calls to mobiles to be included in the same market. This is because of differences between the two types of call:

- Calls to a fixed line require that the recipient be in a specific location at a given time. Calls to mobiles offer a much greater chance of immediate contact, especially if the call is not planned between the caller and recipient. Immediacy of contact is likely to be an important factor in deciding to call someone on their mobile rather than contacting them through other means.

- Substitution of a call to a mobile also requires that the caller knows, or can easily find out, an alternative fixed line number. This may be the case for close friends and family but it is unlikely to be true for all call recipients.

- In addition, for substitution to calling to a fixed line to be relevant, consumers would need to have some understanding of the price of a call to a fixed number relative to a mobile number. Our market research suggests that only around 35% of consumers with a landline or mobile consider they have awareness of the cost of a call to a UK fixed line.[80] This suggests that even if callers faced an increase in the price of calls to a mobile they may not be aware of whether a call to a fixed number could be a cheaper alternative (or even the next best alternative in terms of price).

- Unlike fixed lines, mobile handsets are less likely to be shared with others, thereby offering greater privacy regarding calls received and access to voicemail services. Such privacy may often be valued by the caller.

3.34 Overall we think that, although a call to a fixed number would be an alternative for some callers some of the time, it is unlikely that a significant number of callers would switch in response to a small but significant increase in the retail price of a call to a mobile number. This view was supported by the Communication Consumer Panel,

[80] Kantar Media research in February 2014, see June 2014 Consultation, Annex 18.

which noted the greater chance of immediate contact and the importance of privacy provided by a mobile, but not a fixed, call.

3.35 In their response to the June 2014 Consultation, BT and Virgin noted technological developments that suggest greater fixed-mobile convergence (FMC), meaning that fixed and mobile services may become less distinct over time.

3.36 In the future, fixed and mobile services may become less distinct. Available examples of FMC services typically use landline connections over WiFi or femtocells in certain fixed locations such as an office or campus in combination with national roaming arrangements to offer mobility. FMC services potentially allow the terminating operator to choose how to route a call depending on the recipient's access to different networks. However, if the caller makes a call to a mobile number (reflecting the value of immediate contact) the caller has no control over whether the call is terminated on a fixed or a mobile network. This is not determined by the caller, but by the location of the recipient and the FMC service the recipient has chosen. Therefore, greater use of FMC services is not likely to alter a caller's behaviour.

On-net mobile calls as a substitute for off-net calls

3.37 If higher MTRs were passed through into a price premium for fixed-to-mobile or off-net calls, relative to on-net calls, one possible consumer response is to switch away from off-net to on-net calls. This substitution is only possible for callers who possess multiple mobile subscriptions, and so can choose to make a call on the receiving party's network. Only a small proportion of consumers use two mobile phones or multiple SIMs. According to Ofcom's Technology Tracker, in 2014, fewer than 8% of consumers used two mobile phones with different numbers at least once a month.[81] This is supported by the Kantar Media survey, conducted for Ofcom to inform this review, in which fewer than 4% of mobile users said that they held multiple SIMs, and among these consumers, 46% of them held a second SIM with the same MCP as their main mobile.[82] Therefore, it does not necessarily follow that the holder of multiple SIMs could avoid higher prices for calling a mobile by switching SIMs.

3.38 A second possible means to substitute away from off-net to on-net calls would be to coordinate a group of contacts to use the same network. [83] However, only 6% of respondents to the Kantar Media survey mentioned (unprompted) that having friends and family on the same network was a factor in their choice of mobile operator, although this increased to 11% of respondents when presented as a (prompted) choice. Moreover, there is likely to be limited scope to co-ordinate calls in this way, given the range of people called, and the fact that these people may have further contacts of their own. Indeed, such coordination could, rather than constrain a price

[81] Table 23 from Ofcom, *Ofcom Technology Tracker Wave 2 2014*, published September 2014. http://stakeholders.ofcom.org.uk/binaries/research/statistics/2014sep/technology-tracker-wave-2-2014/main_set.pdf

[82] We note that there are around 83 million subscriptions (see Ofcom, *Communications Market Report 2014*, 7 August 2014), and that this implies a greater number of SIMs per person than the survey evidence. However, we consider that the survey evidence is more relevant since it is likely to reflect SIMs that are in active use for phone calls, as opposed to those that are not in use, are in data devices, or where consumers are in the process of switching from one MCP to another and temporarily have multiple SIMs.

[83] For example through means such as EE's shared family plan: http://explore.ee.co.uk/shared-4gee-plans

rise, encourage it. This is because it may incentivise callers to choose the network that is charging the higher MTRs, which rewards the MCPs imposing this higher rate.

3.39 In conclusion, we do not think substitution to on-net calls would act as a significant constraint on the price of off-net calls.

Call-back arrangements

3.40 Call-back arrangements occur when the receiver of a call agrees to hang up and call the initiating party after contact has been established. The return call can be made using any method convenient for both parties.

3.41 Call back arrangements generally require close and on-going coordination between the two parties involved.[84] Since a reversal means that the recipient now pays for the call, they must either be willing to bear a larger proportion of the costs of calls between the two parties over time or have a sufficient expectation that the original caller will return the favour at a future date.

3.42 The evidence suggests that call-back arrangements are not widespread at present. In the Kantar Media research we asked whether respondents ever used their mobile phone to call someone back to save the caller money. 38% of respondents stated that they had done this, whereas 62% had never done so.[85] Whilst ad hoc call-back arrangements may be significant for some users, they are not widespread across all users.

3.43 Given the above market research findings and the nature of call-back arrangements, we do not think they would act as a significant constraint on the pricing of voice calls to a mobile number.

OTT services

3.44 One potential reaction to an increase in the price of a call to a mobile number is to switch to using OTT services, such as Skype or Viber. A key feature of voice calls delivered using 'pure-OTT' applications is that, at present, the caller initiating a call typically does not face a direct retail charge for that call. Instead, the call is delivered over the user's mobile data connection or WiFi network (if this is available). Therefore, the 'cost' of the call would be recovered through the charge for the subscriber's mobile data connection[86] or their use of a WiFi connection.[87] In our June 2014 Consultation, we presented a range of evidence about the extent of current OTT use, and described some reasons why OTT may not be attractive for many

[84] Call back services are now commonly offered to callers by businesses to avoid individuals having to wait on hold for long periods of time. However, the initial call in this case is unlikely to be to a mobile number. Moreover, this service is unlikely to be sensitive to the price of the initial call.
[85] For those that stated they had done this, we did not ask them how frequently they called others back. However, in the 2011 MCT Statement, we noted that only 17% of mobile users requested a call back at least once a week and that 58% never did. Idem., page 36, paragraph 3.71.
[86] For details of the data usage of VoIP calls over mobile data connections see http://voip.about.com/od/voipbandwidth/f/How-Much-Of-My-Mobile-Data-Plan-Does-Voip-Consume.htm
[87] The WiFi connection may be the end-user's home broadband, work-based broadband or a WiFi hotspot. The recipient may 'pay' in the sense that he or she faces the price of a home broadband subscription, but with large data allowances on broadband the price at the margin of these calls is effectively zero.

calls. EE noted that in order for OTT services to act as a constraint, it is not necessary for substitution to be viable for all users or for all calls, only that there should be sufficient switching in response to a price rise to constrain that rise. We agree that this is the correct approach. However, we think that the evidence currently available suggests the set of calls that could potentially switch to OTT is small and unlikely to be sufficient, for the reasons set out below.

3.45 For even a relatively small proportion of mobile voice calls (say 5%) to be switched to OTT in response to a price rise, it would imply a very large increase in demand for OTT. The Kantar Media survey suggests that some consumers (33% of mobile users) already use OTT voice services. However, the survey suggests that overall OTT use makes up only approximately 5% of all mobile calls by UK customers.[88] So if five per cent of mobile calls were switched to OTT in response to a SSNIP, this would represent a 100% increase in OTT use.

3.46 While we agree that OTT use has grown quickly[89], and is likely to grow further within the review period, we do not think that such high levels of switching are plausible (in response to a SSNIP, as opposed to other market developments) within the time relevant to the current review.

3.47 We believe the current low use by those that already have OTT apps reflects the limited set of call types which are suitable to make using OTT. In particular, evidence from the Kantar Media survey found that only 38% of OTT users mentioned they used it to make calls to UK numbers (implying 13% of mobile users overall), while 40% of OTT users said that they use it for calls to overseas.[90]

3.48 Of those that used OTT for domestic calls, only 47% used it to save money.[91] The figure was much higher for those who used OTT for international calls from the UK (71%). This suggests that price rises are more likely to prompt moves to OTT if they are in the region of the price differentials that apply to international calls (that is, up to £2, and certainly more than the 5-10% usually used for market definition).[92]

---

[88] This figure is calculated by combining evidence from the Kantar Media survey with simple assumptions. The data used from the survey is that 57% of respondents use a smartphone and 35% use another mobile phone; that 53% of smartphone users use OTT services for calls; and that among OTT users, 61% use OTT for less than 10% of their calls; 17% use it for 10-24% of calls; 11% use it for 25-49% of calls; 5% use it for 50-74% of calls; and 2% use it for 75% or more. The assumptions are that: call volumes per customer (including voice and/or OTT) do not differ depending on whether a customer uses OTT or not, or depending on whether they use a smartphone or not; and that for OTT users, their actual OTT use lies in the middle of the category chosen in response to our Kantar survey (e.g. those that said under 10% use OTT for 5% of calls).

[89] For example see Ofcom, *Communications Market Report 2014*, 7 August 2014, noting that the percentage of adults that are users of VOIP services has almost tripled over the last 5 years, to 35%.

[90] 16% said they use OTT for calls to the UK when abroad (numbers do not add up to 100% because multiple responses were available). A similar survey question reported in the most recent CMR found that 32% of all VOIP users use it for calls to mobiles in the UK. See Ofcom, *Communications Market Report 2014*, 7 August 2014.

[91] Other common answers were: to make video calls (44%), because it's convenient (39%), to make group calls (8%), and where I don't have good mobile signal (8%).

[92] In 2013, the average price per minute of a post pay call was 8.7 ppm, and for pre-pay the figure was 6.3ppm (Ofcom, *Communications Market Report 2014*, 7 August 2014, Figure 5.73, page 360). Under most contracts, international calls are outside of the standard bundle, with core prices ranging from 20p to £2 per minute, depending on the country (with only ROI at the cheapest rates) and provider. Add-ons or contracts designed for heavy users of international calls provide cheaper

3.49 44% of OTT users said that they use OTT to make video calls. It is likely that video calling would only be appropriate for a certain proportion of calls (even ignoring the requirement for both parties to have a video calling app), for example because consumers want to make calls on the move, when video calling could be difficult.

3.50 One possible influence on consumers' choice of whether to use OTT for calls may be the cost to them of making mobile voice calls. [✂] Large call bundles may inhibit the use and growth of OTT as even calls which could be made on OTT may be made using standard mobile calls instead if there is no incremental cost of that mobile call. [✂] Moreover, as a significant number of calls are made out of bundle and there may be a cost to consumers from buying large rather than small bundles, there remain costs to consumers for making mobile calls.

3.51 In the June 2014 Consultation, we considered a number of potential practical barriers to the use of OTT (including the need for a smartphone, lack of compatibility between OTT applications, and the resulting need for both users to have the same application). If the marginal cost to customers of additional voice calls is low, even small barriers to the use of OTT could make them unattractive in response to a SSNIP in mobile voice retail prices. EE in its response argued that the practical barriers to the use of OTT are not as great Ofcom had suggested, and are declining. We address EE's points in more detail in the following paragraphs. In contrast, H3G argued that consumers place a high value on being able to contact anyone they might wish to on their mobile phone, and that MCT provides greater quality of service (QoS) and universality of access than potentially competing OTT or alternative mobile communications services.

3.52 We think that there are certainly reasons to consider that the constraint from 'pure-OTT' may strengthen over time. For example, the issue of compatibility may reduce, since 68% of adults report using a smartphone[93] compared to 45% at the end of 2011[94] and at present 16% of individuals without a smartphone say they are likely, very likely or certain to get a smartphone in the next 12 months.[95]

3.53 There is also likely to be increasing familiarity with applications - only 35% of mobile phone users downloaded applications as of February 2014, suggesting room for significant growth.[96] Individuals may overcome compatibility issues by installing multiple applications. As noted by EE, these applications are usually free to

---

international calling, but these remain significantly more expensive than UK within-bundle calls. Source: Pure Pricing September 2013 UK Mobile Pricing database.

[93] Ofcom Technology Tracker data tables. Ofcom, *Ofcom Technology Tracker data tables Wave 2 2014*, table 27 published September 2014. http://stakeholders.ofcom.org.uk/binaries/research/statistics/2014sep/technology-tracker-wave-2-2014/main_set.pdf

[94] Ofcom Technology Tracker data tables. Ofcom, *Ofcom Technology Tracker data tables Wave 3 2011*, table 25 published January 2012. http://stakeholders.ofcom.org.uk/binaries/research/statistics/2012jan/Ofcom_Technology_Tracker_Wa3.pdf

[95] Base: Those without a smartphone. Ofcom, *Ofcom Technology Tracker Wave 2 2014*, published September 2014. http://stakeholders.ofcom.org.uk/binaries/research/statistics/2014Jan/Ofcom_Technology_Tracker_data_tables_for_publication_Wave_3_2013.pdf

[96] Ofcom Technology Tracker data tables. Ofcom, *Ofcom Technology Tracker data tables Wave 1 2014*, table 42 published April 2014 http://stakeholders.ofcom.org.uk/binaries/research/statistics/2014apr/2014w1.pdf

download, so barriers to increasing take-up are limited. Alternatively, a single platform may emerge as a standard over time. The use of VoIP or video calling applications could increase if these services are integrated into popular social networking sites such as Facebook,[97] which recently acquired WhatsApp and is planning to launch a WhatsApp voice service in the near future.[98] EE in its consultation response emphasised that the large number of existing users of WhatsApp make it more likely that any given callers will be in the same user group. Apple also extended its FaceTime application in 2013 to allow voice calls as well as video calls (although currently this remains restricted to calls to and from Apple devices and it is unclear whether this facility is likely to become available on other devices).[99]

3.54 However, we consider that practical barriers are likely to remain important for many calls during the review period, and as such they will continue to limit the set of possible marginal calls that could be switched to OTT in response to a price rise.

3.55 In particular, in the June 2014 Consultation we said that the substitutability of OTT may depend on whether the general sound quality of 'pure-OTT' services is lower than with calls to a mobile number. This may be the case if the network underpinning a service is not managed by the call provider. In addition, calls delivered through these applications may have a larger risk of cutting out when the recipient is on the move as handover between mobile cells will not be as effective as for a voice call to a mobile number. There may also be other aspects of service quality which differentiate VoIP such as perceptions of privacy/security.

3.56 EE argued that in many instances OTT can provide a quality of service that is similar to mobile voice delivered as circuit switched calls. However, as EE itself noted, OTT call quality is likely to be highest (and so most closely substitutable for mobile) in cases where both call participants are stationary, perhaps with a Wi-Fi connection, and when performance is not constrained by congestion.

3.57 We think that quality will continue to act as a barrier to OTT use, in particular because in many instances consumers will not know the location of the person they are calling. While (as suggested by EE) we expect the roll-out of 4G services to improve OTT quality in some circumstances, its quality is likely to still be inferior to mobile voice calls at times of traffic congestion (although these are likely to be less frequent), and when users are on the move.

3.58 EE has highlighted a report by HSBC Global Research which stated that "applications like Skype and WhatsApp now rather undermine the presumption that mobile customers lack countervailing purchasing power."[100] However, other sources suggest that OTT is unlikely to substitute for traditional services in the short to medium term. For example:

---

[97] Facebook added VoIP to its Facebook messenger application in the UK in 2013. See, for example: http://www.techradar.com/news/software/applications/free-facebook-messenger-voip-calls-now-hitting-uk-android-app-report-claims-1141221
and https://play.google.com/store/apps/details?id=com.facebook.orca&hl=en_GB

[98] See http://www.techradar.com/news/phone-and-communications/mobile-phones/whatsapp-delays-its-voice-calling-feature-until-2015-1271071

[99] See http://appleinsider.com/articles/13/06/11/ios-7-beta-facetime-audio-could-deal-blow-to-telecoms-with-free-long-distance-calling

[100] HSBC Global Research, *Supercollider: European mobile consolidation is a win-win for operators and citizens alike*, TMT, February 2014.

- In its report for the European Commission, after considering forecasts of OTT VOIP use for Spain, Italy, Germany, France and the United Kingdom between 2012 and 2020, Ecorys concludes "*that OTT cannot be expected to become a major substitute for the traditional telco services, especially not in terms of revenue*".[101]

- In a research report on mobile voice and messaging, Analysys Mason concludes that so far "*OTT services have had their greatest impact on the messaging market; voice has been left relatively unscathed*" and that although operators must not be complacent "*operator-provided mobile voice services are safer from substitution than their messaging counterparts*".[102] It also notes a decline in mobile VoIP usage with 9% of respondents using OTT mobile VoIP in 2013, down from 11% in 2011 (based on consumers in major European countries).

- The OECD also concludes that "*for some services, it may seem that users may move to over-the-top services that do not have traditional interconnect arrangements or do not interconnect with other services at all"* but that *"[i]n traditional telephony, however, it seems less likely that termination rates will be bypassed in the short term*."[103]

3.59 Our approach is also in line with the 2014 EC Recommendation on Relevant Markets[104], which says that *'currently OTT services are not yet at a level in which they can be considered actual substitutes to the services provided by infrastructure operators'.* In the accompanying Explanatory Notes, the European Commission also notes that while some NRAs have included OTT-based services in their product markets, at the Union level OTT services have been found to exercise only limited competitive constraints.

3.60 Overall, based on the evidence and reasoning set out above we consider that the use of OTT applications is not a close substitute for calls to a mobile number for the time being.

3.61 EE has argued that the analysis in our consultation was not sufficiently forward-looking. It submitted that Ofcom should update its empirical evidence regularly, and review its market power determination and SMP remedies if new evidence indicates that OTT services have become a sufficient constraint on the pricing of traditional mobile voice calls.

3.62 As set out earlier in Section 2, we are not prevented from reviewing any of the markets sooner, but in the absence of unforeseen developments, we currently anticipate that we would time the next market review to conclude three years after the completion of this market review. Given the range of factors that limit the type of calls that are most likely to switch to OTT, we do not think that OTT services will become a sufficient constraint within the period of this review. This is in line with views expressed by the European Commission, the OECD and other industry commentators.

---

[101] Ecorys, *Future electronic communications markets subject to ex-ante regulation*, September 2013, page 71. http://ec.europa.eu/information_society/newsroom/cf/dae/document.cfm?doc_id=3148
[102] Analysys Mason, *The connected consumer survey: voice and messaging*, June 2013.
[103] OECD, 'Developments in Mobile Termination', *OECD Digital Economy Papers,* No. 193, OECD Publishing. February 2012, page 17. http://dx.doi.org/10.1787/5k9f97dxnd9r-en
[104] Explanatory Note to the 2014 EC Recommendation, pages 17-18.

Non-voice communication (SMS, email and social networking sites)

3.63 There are various forms of non-voice communications that can be delivered to a mobile handset and which could act as a substitute for a voice call. These include SMS (or text messages), email, and the use of social networking sites.

3.64 SMS remains well established (used by 83% of all adults), and the use of email and social networking sites on mobile handsets have both been growing since the last review.[105] 78% of adults used email on a mobile in 2014 compared to 68% in 2011, and 53% used social networking sites in 2014 compared to 47% in 2011.[106] The growth of these sectors means that consumers may be becoming more reliant on non-voice communication in their day-to-day lives and could come to regard them as acceptable alternatives to a voice call.

3.65 However, as we have noted before[107], there are fundamental differences between the nature of voice communication and the nature of these alternatives. SMS is limited in length and can be subject to delays in delivery, especially during periods of high traffic. Email is potentially subject to even longer delays depending on how regularly the recipient might check and respond to email. Instant messaging services potentially offer more immediate two-way or many-to-many conversations, but such services still operate within 'closed user groups' whereby not all users will have access to particular messaging applications. Our research in the previous review found that the main use of social networking sites is communication to groups of people. Alternative forms of communication are also not good at the conveyance of 'paralanguage', including pitch, intonation and volume of speech.[108]

3.66 As patterns of communication change it may well be the case that alternative forms of communication will continue to expand. However, it does not immediately follow that price motivated switching from voice to non-voice communication will become significant, which is what is relevant for assessing market definition and market power. We continue to believe that the characteristics of these alternative forms of communication mean they are unlikely to form close enough substitutes to be included in the same relevant market.

Overall level of demand side substitution

3.67 EE submitted that Ofcom had failed to conduct a complete analysis of the extent to which potential demand substitution at the retail level, taking into account all constraints in total, would be sufficient to constrain price increases at the wholesale level. EE argued that Ofcom should:

a) conduct critical loss analysis to assess what quantity of switching would render a SSNIP in MTRs unprofitable; and

---

[105] See Ofcom, *Communications Market Report 2014*, 7 August 2014.
[106] See Ofcom, *Communications Market Report 2014*, 7 August 2014, Figure 5.60 and Ofcom, *Communications Market Report 2012*, 7 August 2014, Figure 5.18.
[107] See June 2014 Consultation and 2011 MCT Statement.
[108] As an aside, we note that a number of services such as SMS are increasingly provided using 'OTT-applications', whereby a user of an OTT-SMS service would avoid paying charges for messages (instead the user pays indirectly via their data connection tariff). But our conclusion is that SMS does not provide a constraint due to the differences between voice services and these other forms of communication. This result is likely to hold, irrespective of the particular method used to deliver SMS.

b) carry out further survey work to assess what proportion of users would switch in response to a SSNIP (that is, what proportion of customers/calls is marginal).

3.68 Critical loss analysis compares the value of lost sales from a SSNIP with the value gained from the price increase on sales that would remain with the hypothetical monopolist. The critical loss threshold is the percentage loss of sales beyond which the margin on lost sales begins to exceed the margin gained on remaining sales. It can be shown that the critical loss is equal to: *SSNIP/(profit margin at the competitive price+SSNIP)).* The margin usually used in this calculation is *competitive price-(average incremental costs),* where incremental costs are those that vary as volumes vary, over the time period and increment relevant to losses that might occur in response to a price increase.

3.69 We do not think that it is appropriate to conduct a formal critical loss analysis because it depends on very uncertain parameters. Critical loss analysis is more usually employed in mergers analysis where the focus is on increases in prices relative to the current situation. In the current case, it would be necessary to define the competitive price in the abstract – which is difficult to do, particularly in the context of a two-sided market.[109] There are also significant difficulties in defining the appropriate measure of costs.

3.70 Moreover, it is problematic to assess the extent of retail price rise that could result from an increase in wholesale MTRs, and to devise survey methods that accurately collect evidence on the extent of likely switching in response.

3.70.1 Firstly, it is not clear what price rise we would be asking consumers about in such a consumer survey. For example, within their existing contracts many post-pay customers face zero marginal prices for individual calls, and it is not clear how a SSNIP in MTRs would affect the price of bundles of calls, or bundles including calls and data.[110] Moreover, even for those customers that face a marginal price for each call they make, we estimate that MTRs make up only around a third of the end-to-end network cost of M2M calls. [111] There is also uncertainty about the extent to which MTR increases would be passed through into retail prices.

3.70.2 Secondly, it is not clear how consumers might react to an MTR price rise. For example, one possibility is that an MTR price rise could lead to an increase in the price of bundles that include a large number of inclusive calls, relative to contracts that include a large amount of inclusive data. The MTR price rise would be constrained if, in response, sufficient consumers chose to switch from call-heavy to data-heavy contracts. They might do this if they thought they could switch a large proportion of their voice calls to OTT instead. EE has argued that its retail pricing is already constrained by OTT in this way, [✂].

---

[109] We have previously discussed this issue in the Mobile Call Termination Statement, March 2007, Paragraphs 3.143-3.154.

[110] For an earlier discussion of these dilution effects, see Annex 2 of Ofcom 2013 FNMR Statement http://stakeholders.ofcom.org.uk/binaries/consultations/nmr-2013/statement/Final_Statement.pdf

[111] And a lower proportion of total retail costs, or of revenue – which is 8.4ppm on average for mobile calls, and 11.1ppm on average for fixed to mobile calls (see Ofcom, *Telecommunications market data tables Q4 2013*, 24 April 2014). For previous estimates of these figures see paragraphs 3.52 and 3.53 of the 2011 MCT Statement.

3.70.3 This kind of consumer decision-making involves complex trade-offs which are made on a one-off basis at the time of choosing a contract, and are influenced by many other factors (including potentially the choice of provider and the choice of phone). In addition, as set out above, most consumers do not have a good awareness of the prices they currently pay for their calls. We therefore do not think it would be possible to formulate a relevant hypothetical question that would gather reliable consumer evidence on the likely response to a SSNIP.

3.71 We set out a similar view in our 2013 FNMR Statement. In that case, as EE noted in its consultation response, it was possible to ask consumers whether, in response to a 5-10% price rise, they would get rid of their landline.[112] We do not think that it would be possible to formulate such a simple question in this case because we do not think that consumers would entirely switch away from making mobile voice calls. Moreover, in that review we rejected the use of critical loss analysis (for the same reasons as we have outlined for the current case), despite having asked survey questions about responses to a SSNIP.[113]

3.72 We consider that neither critical loss analysis nor SSNIP questions in a consumer survey are appropriate in the current case.

Reaction by call recipients

3.73 The above discussion has focused on the possible responses of those making calls. It is also possible that in response to an increase in the price that others make to call them, call recipients could respond, by switching MCP.

3.74 However, because call recipients do not pay for calls they are likely to have a limited incentive to switch provider. We therefore believe that a SSNIP for calls to mobiles is unlikely to cause a significant reaction by call recipients. For this to occur, mobile subscribers would need to be very sensitive to the volume of calls they receive, and so the price charged to others. Research conducted as part of our review suggests that this is not the case: when respondents were asked about the factors determining their choice of mobile (including network provider, mobile handset and tariff) no one mentioned unprompted the cost of others calling them as a factor. This factor was only selected by 2% of respondents when it was presented as a prompted choice. Similarly, as noted above (see paragraph 3.38) few respondents (6%) mentioned friends and family on the same network as a factor in their choice of MCP (which may reflect considerations about the price paid by others to call them). When prompted, this rose to 11% having friends and family as a factor influencing their choice of MCP. These results suggest that called parties are not very sensitive to the price paid by someone to call them and how this might affect the volume / duration of mobile calls they receive.

3.75 Therefore, we do not consider that a material constraint on the pricing of calls to mobiles is likely to be provided by the reactions by call recipients to an increase in the price of calling them.

[112] 2013 FNMR Statement, para 5.56.
[113] Paragraph 5.46 of 2013 FNMR Statement. See also Annex 2 of the same document.

Retail supply-side substitution

3.76 Retail supply-side substitution would involve a firm that is not currently supplying mobile voice calls (to a specific number) to do so relatively quickly following an increase in the retail price.

3.77 Our analysis of demand-side substitution suggests that consumers do not regard alternative forms of communication, including OTT voice services that by-pass mobile numbers, as sufficiently close substitutes for voice calls to a mobile number. It follows from this that supply-side substitution would have to involve the supply of voice calls to the specific mobile number in question.

3.78 In other words, for supply-side substitution to occur calls would need to be terminated on a recipient's mobile number but without the purchase of MCT from the MCP that has been allocated the number in question. In general such by-pass is not possible since the CP that has been allocated a particular number ultimately has control of call routing to that number. We do not believe that such by-pass is likely to occur within the period of this review.

3.79 We therefore believe the possibility of supply-side substitution is unlikely to be relevant in the period of this market review.

Conclusions on the retail market assessment

3.80 Our conclusion is that alternative forms of communication at the retail level are unlikely to constrain the pricing of calls to mobiles within the period of this market review.

3.81 We reach this conclusion for several reasons. Consumers are likely to have limited awareness of the price of calling a particular mobile number. Thus if the price of calls to a specific number were to rise by a small but significant amount, it is not likely to prompt a reaction. But even if awareness were not an issue, we do not think that, when assessed both individually and collectively, there are or will emerge sufficient substitution possibilities to constrain the pricing of calls to mobile numbers during the period of this market review. We also see no feasible opportunities for supply-side substitution.

3.82 As a result of this we do not believe there are any indirect constraints from the retail level on the wholesale market. In the following section, we consider whether any direct constraints might exist.

Wholesale services

3.83 In our June 2014 Consultation, we proposed that the wholesale market definition should not be expanded beyond the starting reference product, i.e. wholesale termination services provided by each MCP for the termination of voice calls to each UK mobile number allocated to it by Ofcom, for which that MCP is able to set the termination rate.

3.84 No consultation respondent disagreed with our proposals about demand or supply-side substitution at the wholesale level. BT noted that the possibility of a complete removal of the call termination bottleneck in the mobile sector in the near to medium term seemed unlikely.

Direct constraints

3.85 For direct constraints to widen the wholesale market definition, sufficient demand or supply-side substitution must occur at the wholesale level to undermine a SSNIP for MCT services to a particular mobile number.

3.86 Demand-side substitution would involve a call originator purchasing MCT, or an appropriate substitute, from an operator other than the one to which the mobile number was allocated. Since we consider that there are no sufficiently close substitutes for calls to a mobile number at the retail level, switching to alternative services at the wholesale level is also not possible.

3.87 Supply-side substitution would involve an MCP, other than the one allocated the relevant number, to begin supplying MCT services to that number in response to a SSNIP. As already noted in paragraph 3.81 this is not currently feasible in the UK.

3.88 Our assessment is that there is no prospect of effective wholesale demand-side or supply side substitution for the period of this review. We also do not consider that there are any likely technological developments which would change this conclusion within the period of this review.

Ofcom's conclusion on wholesale market definition

3.89 Our conclusion, based on our analysis of constraints at the retail and wholesale level and our expectation for technological developments, is that the wholesale market definition should not be expanded beyond the starting reference product: i.e. wholesale termination services that are provided by each MCP for the termination of voice calls to each UK mobile number allocated to that MCP by Ofcom for which that MCP is able to set the termination rate.

Widening and clarifying the product market definition

3.90 In our June 2014 Consultation, we clarified the scope of the product market definition, taking into account consideration of the homogeneity of competitive conditions or common pricing constraints; cluster markets and issues related to the two-sided nature of call termination. We also clarified the scope of the product market definition in relation to certain call types such as: calls to ported-out mobile numbers, calls to voicemail, voice calls to mobile numbers terminating on IP, calls terminated on mobile numbers as part of a national roaming agreement, calls to mobile numbers used for call forwarding services (including international) and calls to UK mobile numbers roaming abroad.

Widening the market on the basis of homogeneous competitive conditions or common pricing constraints

3.91 The analysis of demand and supply side substitution presented above results in a separate product market for MCT being defined for each individual mobile phone number. However, from both a conceptual and pragmatic perspective it may be reasonable to include in the same market the termination of calls to all mobile

numbers allocated to a particular MCP and for which that MCP can set the MTR where: [114]

- an MCP is likely to face homogeneous competitive conditions in providing MCT to the different numbers in its number range, which implies that its conduct in supplying this service in relation to different mobile numbers is likely to be similar; and/or

- an MCP faces a common pricing constraint through its billing system which would make it difficult/costly to charge different prices for MCT on different mobile numbers even if it wanted to.

3.92 For this review we consider that, absent regulation, competitive conditions in the wholesale market for different mobile numbers are likely to be homogenous if the same MCP sets the termination rate. We consider, however, that competitive conditions differ between mobile numbers for which different CPs set the termination rate. Therefore, on the basis of homogeneous competitive conditions, we define 72 different markets corresponding to each MCP which currently provides MCT or which we expect to be doing so during the market review period.

3.93 We have considered whether the market should be widened beyond the separate markets for each MCP, identified in the preceding paragraph. However, we do not think there is any reason to do this. This is because a different MCP sets the termination rate in each of the 72 markets that we identify, and we believe that each of these MCPs would be able to set the MTR independently, absent SMP regulation. Indeed, where MCPs have faced differing forms of SMP regulation, and particularly, when they have not been subject to a charge control, they have priced very differently from other MCPs. This can be seen in Table 7 of Section 4 below.

3.94 Thus we conclude that there is no common pricing constraint linking the MTR set by different MCPs.

Two-sided markets and cluster markets

3.95 A market definition can, potentially, be broadened because of linkages created by two-sided relationships (i.e. where a firm supplies a service to two or more distinct groups of customers each of whom derives some benefit from the fact the service is also supplied to the other groups), and by the 'clustering' of products (i.e. where they are typically marketed and sold as a bundle).

3.96 In delivering MCT, MCPs are providing a service to two sides of a market – customers on other networks that are making calls, and its own customers that are receiving calls as part of a wider package of services. Prices and resulting demand on one side of the market (callers) could affect demand on the other side of the market (those paying for a package that includes receipt of calls). Moreover, revenue earned on one side of the market may be used to fund price reductions on the other side of the market. It is sometimes argued that the fact that the two sides of the

[114] See, for example: Explanatory Note to the 2014 EC Recommendation section 2.5; the SMP Guidelines, paragraph 56; ERG, *ERG Common Position on Geographic Aspects of Market Analysis (definition and remedies),* October 2008. http://www.irg.eu/streaming/ERG%20(08)%2020%20final%20CP%20Geog%20Aspects%20081016.pdf?contentId=545387&field=ATTACHED_FILE

market are linked means that in some cases they could be considered as a single market covering both sides.

3.97 EE also argued that as the mobile market as a whole, i.e. across retail and termination services, is not making excessive returns, we should not intervene in the market. However, even if high termination rates were completely competed away in the retail market, we would still have concerns that high termination rates could lead to an inefficient structure of prices and reduced competition. Moreover, it is not clear that all excess margins in call termination would necessarily be returned to the retail market via what is often described as a "waterbed" effect (see Section 6). This means high termination rates could potentially lead to excess returns overall.

3.98 We believe that in the case of mobile services, although there is interaction between the two sides, the competitive conditions and constraints on the two sides of the market are different. Although there is an interaction, it does not remove the ability to set excessive prices on one side. In particular, with no competitive constraints on MTRs, MCPs have the ability to set them above the competitive price level (for example, this happened when MTRs were not regulated).

3.99 Therefore, while we recognise that the two sides of the market are connected, we do not think it is appropriate to broaden the market definition on this basis. We therefore conclude that MCT should be viewed as a separate market, albeit with close links to the retail side.

3.100 Ofcom has also considered whether it is appropriate to consider MCT as part of a 'cluster market' at the retail level. That is, whether competition occurs over a bundle of retail services that includes both off-net calls - for which MTRs may directly affect prices - and other mobile services (such as on-net calls, texts and data services). We noted above that, due in part to calling party pays arrangements, consumers do not consider the price of incoming calls (i.e. MTRs) to be important when choosing a subscription. This means that even though the ability to receive calls is sold as part of a mobile subscription, this aspect of the service is not charged to the subscriber and does not drive switching behaviour by subscribers. Therefore, we do not think it appropriate to include MTRs as part of a wider cluster market.

Numbers and call types falling within our market definition

3.101 Above we concluded that the provision of MCT to all the mobile numbers allocated to a particular MCP should be included within the same market. Here we clarify which 'types' of termination services are covered by this market definition.

3.102 We consider the market for MCT will include:

- any call conveyance technology used to deliver voice call termination to a mobile number, whether delivered by 2G, 3G, VoIP or VoLTE based technologies; and
- all mobile number ranges allocated to a particular MCP over which it is able to set the rate charged to originating (or transit) CPs.

3.103 We also conclude that our market definition includes the following 'types' of voice call termination:

- *Ported-out numbers (while ported-in numbers are excluded).* Ported numbers are subject to specific charging arrangements, which mean that the MTR for calls to those numbers is determined by the donor network originally allocated the

number. We therefore include the termination of calls to ported-out numbers as part of that operator's termination market.

- *Calls to voicemail*. When a call is diverted to voicemail, such traffic is still included in our market definition. The number range holder decides whether and how to divert a call to a particular mobile number and faces the same competitive constraints in setting the termination rate as for a call that is connected to the intended recipient.

- *National roaming*. A call may be terminated by another MCP using national roaming arrangements. However, the MTR is set by the MCP that has been allocated the number and thus we conclude that the termination of these calls forms part of this MCP's market.

- *Other call types*. Some calls are not typically calls between end users (e.g. test calls, calls to customer services) and may not logically form part of the market definition. However, since such call volumes are a very small proportion of the total, as in our previous review, we do not think it proportionate to perform a more detailed analysis. We conclude that these calls are within the market where the call is made to a UK mobile number and a common pricing constraint means they are charged the MCP's MTR.

3.104 In addition to the above call types, we have considered in more detail:

- *Call forwarding services*; and

- *International roaming* (which is subject to more complicated charging and routing arrangements).

3.105 Information gathered from smaller MCPs (see Annex 4) suggested a number of these MCPs provided international call forwarding services, routed via UK mobile numbers. These services may involve UK consumers calling UK mobile numbers in order to make international calls or may involve consumers outside the UK calling people within the UK on their UK mobile numbers. [✂] argued that such services should be excluded from our review because they are different from traditional mobile services. [✂] also raised a question as to whether it may be possible to take a different approach for the termination of international calls.

3.106 For example, one MCP [✂] which characterised its services as international dial-through services (using UK mobile numbers) argued that it competes in a different market, specifying that it has no subscribers because consumers call its number ranges specifically to access its international dial-through services.

3.107 Another MCP ([✂]), whose service involves forwarding calls made by consumers outside the UK, argued that its MTRs should not be included within this market review because its services are used exclusively by non-UK consumers and its MTRs are paid by international operators, via payments that are governed by the recommendations of the International Telecommunications Union.

3.108 We acknowledge that, for example, not all calls to mobile numbers will necessarily involve a voice call being terminated on a mobile phone, and that the set of possible competitive constraints, and their strength, may differ across service types. For example, as set out above, OTT is more often used for international than domestic calls, and as such may exert a stronger constraint on international call forwarding services than on traditional mobile services. We also note that some services using

UK mobile numbers are targeted at providing call services where either the called party or the calling party is not located in the UK.

3.109 Nonetheless we include calls to call forwarding services that use mobile numbers within our list of focal products, and treat them in the same way as standard mobile calls. This is for the following reasons:

- First, as with the pricing of termination for other call-types, access and pricing to the termination service is controlled by the MCP allocated the UK mobile number. In these circumstances the MCP is able to set the MTR, irrespective of the final destination of the call or the location of the calling party. Evidence on MTR prices set by smaller MCPs suggests that current constraints are not sufficient (see Section 4).

- Second, given the numbers are part of the range designated for mobile services, consumers would generally expect (or should be able to expect) these services to be mobile, and charged as a normal mobile call. Higher MTRs for such calls could lead to consumer confusion (and in some cases to bill-shock). Even where the calling party is aware that the mobile number is being used to support call forwarding (such as for international calls), the wholesale competitive conditions would largely remain as above, i.e. the terminating MCP is in a position to set a high MTR to originating or transiting CPs.

- Also, given the variety of services which are currently offered through mobile number ranges and since call volumes for such services are a very small proportion of the total, we do not think it proportionate to perform a more detailed analysis in respect of each individual type of service.

3.110 We note that the National Telephone Numbering Plan includes other number ranges that are more suitable for the provision of forwarding services – of which international call forwarding is but one example. For example, some specific non-geographic numbers can be used to support call forwarding services.[115]

3.111 *International roaming* is a service that allows mobile subscribers to use their mobile phone to make and receive calls while visiting another country. For the purposes of our market definition, we consider the following two cases: a) UK mobile subscribers (using 07xx UK mobile numbers) roaming outside the UK and b) foreign mobile subscribers (using foreign mobile numbers, e.g. +39 xxx) roaming on a UK network.

3.112 In the first case, we believe that calls made to UK mobile numbers while the call recipient is roaming abroad are part of the relevant MCT market. Calls made to UK subscribers roaming abroad are initiated by a call to the UK mobile number and are initially routed to the UK home network which effectively terminates the calls from the perspective of the paying (i.e. originating or transiting) CP. The home MCP charges an MTR and then forwards the calls to the foreign visited networks in the relevant foreign countries where the UK subscribers are temporarily roaming.

[115] See Ofcom, *The National Telephone Numbering Plan*, 8 July 2014, available at http://stakeholders.ofcom.org.uk/binaries/telecoms/numbering/Numbering_Plan_Dec_2013.pdf. A new version of the plan will take effect on 1 July 2015 and is currently published for information only: http://stakeholders.ofcom.org.uk/binaries/telecoms/numbering/Numbering_Plan_version_26_June_2015.pdf

3.113 The second case we consider is when call recipients are foreign mobile subscribers (with a foreign mobile number) roaming on a UK network. In this case, the charges the UK hosting network levies are typically different from the MTRs charged for calls terminated on UK mobile numbers. Calls to foreign mobile numbers will be subject to the roaming agreement between the UK visited network and the foreign home network, an agreement which is itself subject to separate regulation. As such, the competitive conditions for the termination of these calls are different from those of calls terminated to UK mobile numbers. In particular, unlike the wholesale market for termination to UK mobile numbers controlled by each MCP, there is competition in the provision of wholesale roaming services in the UK for visiting (i.e. overseas) MCPs. That is, the foreign network can choose among several UK national MCPs to provide wholesale call services in the UK (which will include termination for calls to its subscribers when they roam in the UK). Therefore, because the number ranges, routing and billing arrangements, and competitive conditions differ for wholesale roaming services (including termination) provided by UK MCPs, and taking into account the modified Greenfield approach and existing regulation of wholesale roaming, we conclude that these calls fall outside the MCT markets subject to this review.

3.114 Finally, any call originated internationally (i.e. where the subscriber is not roaming in the UK) and terminated on a UK mobile number is considered to be part of the relevant MCT market.

Summary of call types included within our wholesale product market definition

3.115 Table 4 summarises the call types included within our wholesale product market definition compared to the MCT 2011 Statement. These are the same call types as included within our wholesale product market definition proposed in our June 2014 Consultation.

Table 4: Comparison of call types included in this and the previous MCT market review

Call type	2011 Market Review	2015 decision
Voice calls	Terminated on a UK mobile number	Terminated on a UK mobile number
Off-net origination	✓	✓
On-net origination	×	×
Calls to ported-in numbers	×	×
Calls to ported-out numbers	✓	✓
Calls to voicemail	✓	✓
Voice calls to UK mobile numbers terminating on IP	✓	✓
National roaming	✓	✓
International call forwarding[116]	✓	✓
Calls to UK mobile numbers roaming abroad	✓	✓
Calls to non-UK numbers roaming in UK	×	×

[110] This includes calls originated internationally and terminated to UK mobile numbers and calls to UK mobile numbers subsequently forwarded to international numbers. These calls form part of the relevant markets but, as set out in paragraphs 5.123, the costs associated with international conveyance/transit are not relevant to the costs incurred for the provision of MCT within the UK.

Geographic market definition

3.116 Having defined the relevant wholesale product market, we now assess the geographic scope of the relevant wholesale market. No stakeholders made any points about geographic markets.

3.117 At the wholesale level, MCT services are accessed by an originating CP at a relevant handover point on the terminating MCP's network.

3.118 According to the information provided in response to our section 135 information requests, terminating MCPs may have one or more of these handover points within the UK, which act as the gateway to various MCT services they offer. CPs seeking to interconnect directly with the terminating MCP will do so at the nearest available handover point. However, a call originated to a UK mobile number that is handed over at one location could in principle be handed over at another location within the UK.

3.119 That is, in the hypothetical context where a monopoly supplier of calls to a particular number range attempted to impose a SSNIP above the competitive level at one point of handover, in theory this could be constrained by the originating network switching to another point of handover. Therefore, any particular handover point would be a substitute for another, which in theory would suggest widening the geographic scope of the market to any part of the UK where handover is possible for the termination of calls to the UK mobile numbers in question.[117]

3.120 In practice, since the identity of the MCP providing termination to a particular number range would have to be the same, whatever the point of handover, the conventional SSNIP analysis for geographic market definition is perhaps unnecessarily abstract in this case. However, consideration of the real world circumstance for physical interconnection leads to the same conclusion on the geographic scope of the market as we would obtain from the hypothetical situation described in the previous paragraph. In other words, competitive conditions will not differ between handover points within the UK, as, regardless of the location, all termination points provide connection to all UK mobile numbers for which the terminating CP controls the MTR. This also suggests it is appropriate to define the market as the area for which the MCP can determine the MTR in relation to its allocated UK mobile numbers.

3.121 The geographic definition applies to all types of providers including MCPs that have entered (or plan to enter) the market with limited geographic coverage; those MCPs that use IP and/or circuit switched voice; and/or different radio technologies such as licensed (e.g. 2G, 3G, 4G) or unlicensed spectrum (e.g. WiFi) technologies. MCPs that have been allocated UK mobile numbers will need to have some sort of handover point within the UK. MCPs providing call termination to those numbers would have the same ability and incentive to control the MTRs as with other MCT services.

[117] In practice, originating operators are likely to face costs of building out to alternative handover points. So there could be fairly significant switching costs of establishing direct interconnection at another point of handover. However, operators with a national presence (e.g. BT) will have extensive interconnection infrastructure already in place and so the costs of switching originating traffic between handover points are likely to be quite low.

Ofcom's conclusion on geographic market definition

3.122 We therefore conclude that the scope of the geographic market definition relates to the area (i.e. an MCPs' relevant handover points) for which the MCP can determine the MTR in relation to its allocated UK mobile numbers. This area lies within the UK.

Ofcom's conclusion on market definition

3.123 Taking account of the reasoning outlined above, we adopt the following market definition:

> "termination services that are provided by [named mobile communications provider] ("MCP") to another communications provider, for the termination of voice calls to UK mobile numbers[118] allocated to that MCP by Ofcom in the area served by that MCP and for which that MCP is able to set the termination rate."

3.124 We consider that this is consistent with the 2014 EC Recommendation which identifies "*voice call termination on individual mobile networks"* as a market which is susceptible to *ex ante* regulation. Rather than using the term 'network', we have referred to number allocation, so as to avoid confusion relating to providers that do not own their own physical network, and to highlight that our approach is technology neutral, as recommended in the EC's explanatory note to that recommendation.[119] Our geographic market definition is also in line with the 2014 EC Recommendation that the geographic scope of each market coincides with the geographic coverage of the network concerned, and is usually national.[120]

3.125 Based on the above definition, we have identified a total of 72 separate markets for wholesale MCT services. This comprises 68 smaller MCPs, and the four largest MCPs. In Annex 4 we set out the analysis conducted in relation to smaller MCPs and our conclusions regarding their inclusion in this review. Table 5 below lists the MCPs included.

Table 5: Relevant MCT markets

Mobile Communications Provider	Mobile number range/s currently allocated	Provision of mobile call termination
(AQ) Ltd	7520 7	Future plans to offer MCT
08Direct Ltd	7406 8	Yes
24 Seven Communications Ltd	7406 6, 7893 1, 7911 2, 7911 8	Yes

[118] These are the numbers included in the number ranges designated for "mobile services", as defined in the National Telephone Numbering Plan. In the current Numbering Plan, these are numbers in the format 07xxx xxx xxx and beginning 071 to 075 and 077 to 079.
[119] See Explanatory Note to the 2014 EC Recommendation.
[120] See Explanatory Note to the 2014 EC Recommendation, sub-section "*Relevant geographic market*" under section 4.1.3.

Mobile Communications Provider	Mobile number range/s currently allocated	Provision of mobile call termination
Ace Call Ltd	7418 6	Yes
Airwave Solutions Ltd	7458 4, 7753 0	Yes
Alliance Technologies LLC	7571 8	Yes
Andrews & Arnold Ltd	7441 1	Yes
AQL Wholesale Ltd (previously Telephony Services Ltd)	7822 4, 7822 6, 7893 8	Yes
Bellingham Telecommunications Ltd	7418 1	Yes
British Telecommunications Plc	7777 0-9	Yes
BT OnePhone Ltd	7520 1	Yes
CFL Communications Ltd	7537 7	Yes
Cheers International Sales Ltd	7406 0-2, 7822 7, 7978 4	Yes
Citrus Telecommunications Ltd	7874 4, 7893 9	Yes
Cloud9 Communications Ltd	7440 9, 7700 0, 7872 2, 7924 5, 7978 2-3	Yes
Compatel Ltd	7465 3	Future plans to offer MCT
Confabulate Ltd	7559 5	Yes
Core Communication Services Ltd	7520 4, 7744 2-9, 7755 2-5	Yes
Core Telecom Ltd	7417 9, 7441 8, 7559 7	Yes
Eclipse Tel Ltd	7418 8	Yes
Edge Telecom Ltd	7892 2	Future plans to offer MCT
EE Ltd	Numbers in the 74, 75, 77, 78, 79 ranges.	Yes
Esendex Ltd	7520 5	Future plans to offer MCT
Euro Thai Exchange Process	7589 0, 7893 3	Yes

Mobile Communications Provider	Mobile number range/s currently allocated	Provision of mobile call termination
Company Ltd		
FleXtel Ltd	7822 0, 7892 5	Future plans to offer MCT
Fonix Mobile Ltd (previously Orca Digital Ltd)	7520 8	Future plans to offer MCT
Hay Systems Ltd	7892 0	Yes
Hutchison 3G UK Ltd	Numbers in the 74, 75, 77, 78, 79 ranges.	Yes
Icron Network Ltd	7822 5, 7978 5	Yes
Invomo Ltd	7520 9	Yes
IPV6 Ltd	7559 2	Yes
IV Response Ltd	7978 9	Yes
LegendTel LLC	7559 1	Yes
Limitless Mobile Ltd	7458 8	Future plans to offer MCT
Lycamobile UK Ltd	Numbers in the 74 range.	Yes
Magrathea Telecommunications Ltd	7893 0	Yes
Mars Communications Ltd	7559 0	Yes
Moonshado Inc	7589 9	Yes
Mundio Mobile Ltd	7451 0-1, 7451 3-4, 7451 8-9, 7457 0-1, 7457 3, 7457 5, 7465 0-1, 7520 2, 7589 4-7, 7892 1	Yes
Nationwide Telephone Assistance Ltd	7700 1	Yes
Netfuse Telecom Ltd	7465 5	Future plans to offer MCT
Nodemax Ltd	7559 8	Future plans to offer MCT
Oxygen8 Communications UK Ltd	7589 1-3, 7822 9, 7978 6	Yes

Mobile Communications Provider	Mobile number range/s currently allocated	Provision of mobile call termination
Premium O Ltd	7451 5	Yes
Premium Routing GmbH	7458 2	Future plans to offer MCT
Proton Telecom Ltd	7417 6	Yes
QX Telecom Ltd	7978 1	Yes
Resilient Plc (previously Resilient Networks Plc)	7559 9	Future plans to offer MCT
Rexcom Tech Ltd	7417 7	Yes
Simwood eSMS Ltd	7520 0	Future plans to offer MCT
Sound Advertising Ltd	7441 0, 7537 6	Yes
Spacetel UK Ltd	7457 7	Yes
Stour Marine Ltd	7441 3, 7537 1	Yes
Swiftnet Ltd	7537 3, 7822 1	Yes
Synectiv Ltd	7441 5, 7441 7	Future plans to offer MCT
TalkTalk Communications Ltd	7439 0-1, 7822 2	Future plans to offer MCT
Telecom North America Mobile Inc	7418 5	Yes
Telecom2 Ltd	7406 5	Yes
Telecom 10 Ltd (previously Sky Telecom Ltd)	7872 7	Yes
Teleena UK Ltd	7418 7-9	Yes
Telefonica UK Ltd	Numbers in the 71, 74, 75, 77, 78, 79 ranges.	Yes

Mobile Communications Provider	Mobile number range/s currently allocated	Provision of mobile call termination
TG Support Ltd[121]	7406 7, 7418 2	Yes
Tismi BV	7418 3, 7441 4, 7451 2, 7520 6	Yes
Titanium Ltd	7406 4	Yes
Truphone Ltd	7408 0-2, 7408 8-9, 7417 8, 7559 4, 7978 8	Yes
UK Broadband Ltd	7451 6-7	Future plans to offer MCT
Virgin Mobile Telecoms Ltd (Virgin Media Ltd)	7458 3	Future plans to offer MCT
Vodafone Ltd	Numbers in the 74, 75, 77, 78, 79 ranges.	Yes
Voicetec Systems Ltd	7457 4	Yes
Vortex Telecom Ltd	7406 3	Yes
Voxbone SA	7441 9	Yes
Wavecrest (UK) Ltd	7537 0	Future plans to offer MCT

[121] According to Companies House, TG Support Ltd went into administration on 11 November 2014. Nonetheless, its appointed administrators have informed us that it is presently using the mobile number ranges allocated to it to provide MCT services. We have therefore included the company in our market analysis.

Section 4

SMP assessment

Summary

4.1 This section sets out our conclusions on whether any MCP operating in a relevant market is able to act, to an appreciable extent, independently of competitors, customers and, ultimately, consumers – that is, whether it has SMP in that market.

4.2 We conclude that each MCP, including the four largest MCPs and MCPs with fewer subscribers (smaller MCPs), has SMP in the corresponding relevant market. These MCPs are listed in Annex 3.

4.3 This is based on the fact that each MCP has a 100% share of the relevant market and this position has endured throughout the period in which they have operated in this market. In addition, there are high barriers to entry and countervailing buyer power is not sufficient to counterbalance this market power. Pricing evidence is consistent with the absence of competitive pressure. These arguments are in line with the proposals in our June 2014 Consultation.

4.4 A few stakeholders provided comments, either directly or indirectly, in relation to our proposals on SMP. H3G agreed with our SMP assessment and BT's comments suggested that it also agreed with our conclusions on SMP. Furthermore, BT highlighted that the complete removal of the call termination bottleneck in the mobile sector in the near to medium term seems unlikely.

4.5 EE argued our market power assessment should take into account the sum total of all competitive constraints, including those which arise from outside the relevant market and in particular OTT. We address this point in paragraph 4.57.

4.6 Two smaller MCPs argued that they do not have significant market power. CFL Communications Ltd ('CFL') stated that it had a different business model to the four largest MCPs. This is addressed in paragraph 4.25 below. Both CFL[122] and [✂] argued that their ranges were banned from many of the big four suppliers. We address these points in paragraphs 4.34 to 4.43 below.

4.7 Several respondents, including Telefonica, EE, [✂], Verizon and Virgin Media, commented on the pricing behaviour of smaller MCPs, pointing out that many smaller MCPs have been charging MTRs above the 2011 benchmark MTR.

4.8 The rest of this section covers the following:

- An outline of the regulatory framework, including the legal framework, our approach to assessing SMP and findings from related Ofcom reviews.
- Our views and responses to stakeholder comments on each of the main criteria for assessing SMP in this case, namely;
  - o market shares;

[122] Email from CFL Communications, to MobileTermination2015@ofcom.org.uk, 6 June 2014, 18.31.

- barriers to entry;
- countervailing buyer power; and
- evidence of pricing behaviour.

- Our conclusions on the SMP assessment.

Regulatory and analytical framework

Ofcom's power to make SMP determinations

4.9 Having defined the relevant markets we must assess competition in those markets in accordance with the Act and the common regulatory framework and impose regulation where competition in those markets is found to be ineffective, i.e. where one or more undertakings have SMP.

Definition of SMP

4.10 An undertaking has SMP if "…*either individually or jointly with others, it enjoys a position equivalent to dominance, that is to say, a position of economic strength affording it the power to behave to an appreciable extent independently of competitors, customers and ultimately consumers*."[123]

Our approach to assessing SMP

4.11 Our starting point for assessing SMP is to take account of the SMP Guidelines, in accordance with section 79 of the Act. In addition, we take into account the European Regulators Group (now BEREC) working paper on SMP ('the ERG SMP Position') that builds on the SMP Guidelines.[124]

4.12 The SMP Guidelines state that:

"*Market shares are often used as a proxy for market power. Although a high market share alone is not sufficient to establish the possession of significant market power (dominance), it is unlikely that a firm without a significant share of the relevant market would be in a dominant position."*

4.13 The SMP Guidelines set out other criteria relevant to an assessment of SMP, in addition to market share.[125] We have focussed our assessment on what we see as the four broad areas most pertinent to the markets under consideration, namely:

---

[123] Section 78 of the Act, Article 14(2) of the Framework Directive, and paragraph 70 of the SMP Guidelines.
[124] See SMP Guidelines, paragraphs 75 to 82
http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2002:165:0006:0031:EN:PDF
See Section 3, paragraphs 7 to 23 of the ERG SMP Position
http://berec.europa.eu/doc/publications/public_hearing_concept_smp/erg_03_09rev3_smp_common_concept.pdf
[125] Paragraph 75 of the SMP Guidelines notes that persistent and high market share is a strong indicator of a dominant position. The SMP Guidelines state that the following criteria can be used to measure the ability of an undertaking to behave to an appreciable extent independently of its competitors, customers and consumers: overall size of the undertaking, control of infrastructure not

- market shares;
- barriers to entry;
- countervailing buyer power; and
- pricing.

4.14 Whilst pricing is not listed as one of the criteria in the SMP Guidelines, excessive pricing is listed in the ERG SMP Position.[126] In particular, "*...the ability to price at a level which keeps profits persistently and significantly above the competitive level is an important indicator for market power*."

4.15 When assessing whether SMP exists with respect to a particular market, we need to consider how to account for the effects of both existing and proposed regulation. This is known as the 'modified Greenfield approach'. Without taking this step, our market analysis could fail to identify SMP where a CP's behaviour is constrained by existing regulation (or the threat of regulation). The modified Greenfield approach was endorsed by the Court of Appeal when assessing countervailing buyer power (CBP) in the context of H3G's appeal against our 2007 MCT Market Review ('the H3G Judgment').[127]

4.16 Specifically, the modified Greenfield approach involves assessing SMP in the relevant market in a hypothetical scenario where there is an absence of any regulation in the proposed market - whether current or potential - that arises or would arise from a finding of SMP. However, this assessment would still take into account any regulation that will continue to exist throughout the period being assessed in this market review and which is independent of an SMP finding in the market concerned.

4.17 In this review, we have taken into account the following relevant regulation:

- BT's end-to-end (E2E) connectivity obligation, as the most directly relevant *ex ante* regulation binding on BT's negotiation of MTRs;[128]
- obligations relating to other regulated fixed voice services. For instance, the fact that BT and other Fixed Communication Providers' (FCP's) fixed termination rates are themselves regulated; [129]

---

easily duplicated, technological advantages or superiority, absence of or low CBP, easy or privileged access to capital markets/financial resources, product/services diversification, economies of scale or scope, vertical integration, a highly developed distribution and sales network, absence of potential competition and barriers to expansion. A dominant position can derive from a combination of these criteria which taken separately may not necessarily be determinative.

[126] See the ERG SMP Position, paragraph 20.

[127] See paragraphs 53 and 64, Hutchison 3G UK Ltd v Office of Communications [2009] EWCA Civ 683, 16 July 2009 http://catribunal.org/files/CofA_Judgment_1083_H36_16.07.09.pdf

[128] BT has a regulatory obligation to purchase (on reasonable terms) wholesale narrowband (fixed and mobile voice and narrowband data) call termination services from any provider of public electronic communications networks (PECN).

[129] Regulatory conditions imposed both on BT and on other FCPs constrain the exercise of SMP in fixed network call termination markets and prevent them from setting excessive charges in those markets. See paragraphs 6.65 to 6.74 of our 2013 FNMR Statement.

- BT's obligations to provide services which support interconnection, namely interconnection circuits;[130]

- wholesale call origination[131], local loop unbundling (LLU)[132], wholesale line rental (WLR)[133] and leased lines obligations;[134] and

- Ofcom's dispute resolution powers concerning the above regulation.

4.18 This approach is consistent with the approach we took in our three previous MCT market reviews.[135] We considered all of the other criteria listed in the SMP Guidelines and the ERG SMP Position in our 2007 MCT Statement[136]. However, we concluded that these other criteria had less relevance to an assessment of SMP in wholesale MCT markets. Our approach takes account of the ERG SMP Position and relevant case law as well as the impact of relevant regulation. It also considers the commercial context in which MCT is sold and the relative strength of any CBP.

2013 FNMR

4.19 In the 2013 FNMR we assessed market power for wholesale fixed geographic call termination. The reason for noting this review is that the market power and competition considerations that arise in fixed call termination are similar to those which arise in MCT. Reflecting the two-way access nature of termination services, fixed CPs are purchasers of MCT and mobile CPs are purchasers of fixed call termination.

4.20 We found that each CP has SMP in wholesale fixed geographic call termination within the relevant market applicable to that CP. In reaching this conclusion, we noted that each CP had 100% market share in its respective market and that barriers to entry were high in these markets. We also rejected CBP as an effective constraint on the market power of CPs in their relevant fixed termination markets.[137]

---

[130] See Section 10, pages 238 to 278 of our 2013 FNMR Statement.
[131] See Section 5, pages 40 to 143 of our 2013 FNMR Statement.
[132] Full LLU is the process where BT makes its local access network (the cables that run from customers' premises to the telephone exchange) available to other CPs. These CPs are able to offer voice and, broadband using their own infrastructure.
[133] WLR is the regulated service which allows CPs to rent access lines from BT, but where there is not full control of the access line; in contrast to full LLU. With WLR CPs must use the BT network for voice services and broadband (although partial LLU coupled with WLR allows CPs to take greater control of the broadband service).
[134] MCPs use large volumes of leased lines to carry mobile voice and data traffic between their radio base stations and switching centres. BT is obliged to sell leased lines to MCPs in compliance with a charge control. See for example: Ofcom, *Business connectivity market review – final statement,* 28 March 2013 http://stakeholders.ofcom.org.uk/consultations/business-connectivity-mr/final-statement/
[135] Ofcom, *Wholesale Mobile Voice Call Termination*, Statement, 1 June 2004 http://stakeholders.ofcom.org.uk/binaries/consultations/mobile_call_termination/statement/Statement_on_Wholesale_Mobi1.pdf See also the March 2007 Statement and the MCT 2011 Statement.
[136] See paragraphs 4.25 - 4.63, pp. 57 – 65.
[137] See Ofcom, 2013 FNMR Statement, Section 6, pages 152 to 159.

Assessment of SMP

Ofcom's assessment based on market shares

4.21 Market shares are often used as a proxy for market power. Although a high market share alone is not sufficient to establish SMP, very large market shares are usually taken as an indication that SMP is present in the relevant market.[138]

4.22 Each MCP has a 100% share in the relevant market. This is because only the terminating MCP has the ability to provide MCT to the numbers allocated to that MCP. This means that each MCP is, in effect, a monopolist in the supply of MCT to its customers.

4.23 We recognise that mobile subscribers may receive calls on their handsets for which their MCP does not set the MTR. This includes 'pure-OTT' calls made on applications such as Skype or Viber. However, as set out in Section 3, we believe such calls fall outside the relevant market.

4.24 In addition, as explained in Section 3, calls to numbers which are ported-in to an MCP would not fall within the relevant market, as the MCP does not have the ability to set the MTR. Conversely, calls to numbers which have been ported-out by a particular MCP would still fall within that MCP's relevant market, as it would retain the ability to set the MTR for those calls. In the timeframe of this review, we do not envisage any changes to the regulatory regime for mobile number portability which would alter this analysis.

4.25 Two smaller MCPs (CFL and [✂]) highlighted their relatively small size, particularly with reference to the big four MCPs. However, a smaller MCP will still have 100% market share in the relevant market as set out in Section 3. This is regardless of the fact that the size of the relevant market may be small or that MCPs have different business models.

4.26 As in the MCT 2011 Statement[139], this market share analysis implies that in the absence of other considerations, each MCP has SMP in its relevant market.

Ofcom's assessment of barriers to entry

4.27 In this section, we consider whether there is scope for a third-party MCP to enter the relevant market, by offering MCT on another MCP's network. This could undermine the SMP of the existing MCP, either by actual entry or the threat of entry.

4.28 One way in which entry could occur is if MCPs invest in further infrastructure that enables the provision of MCT on another MCP's network. While this might be a theoretical possibility, it has not materialised to date and is not likely to do so for this review period, for two reasons:

i) MCPs, each with 100% share of their own relevant market, would not have strong incentives to risk forgoing the monopoly profit that can be earned from MCT provided to their subscribers. If they purchase or invest in technology allowing

[138] See paragraphs 75 – 77 of the SMP Guidelines.
[139] See Ofcom, 2011 MCT Statement, paragraphs 4.25 – 4.35.

access to another MCP's number range or subscribers, such technology is likely to be available to their rivals.

ii) We are not aware of infrastructure mechanisms allowing such entry to occur.[140]

4.29 An alternative means of accessing a caller is through the use of OTT applications. As discussed in Section 3, we believe that 'pure-OTT' services fall outside the scope of our market definition. Therefore use of such services cannot be seen as entering the relevant market.

4.30 In some cases, an OTT application may have been assigned a mobile number, and this may provide an alternative number by which to contact the intended recipient using a number from the mobile range (i.e. starting 071-075 or 077-079). This is compared to a 'pure-OTT' service which does not rely on number ranges for the provision of call termination. However, we are not aware that the use of such services is material; nor have we seen evidence of it constraining the access or pricing behaviour of the terminating MCP.

4.31 Unless called parties had multiple numbers on which to call them and calling parties selected between them on the basis of price, it seems unlikely that entry into the provision of voice calls via OTT applications would constrain the market power of the MCP setting MTRs for a given number range.

4.32 We therefore conclude that, given current technology and looking ahead to the period covered by this market review, OTT services are unlikely to undermine the SMP of an existing MCP.

4.33 Overall, the nature of MCT implies that these markets have significant barriers to entry, and there do not appear to be any developments which would counter our finding of SMP over the review period.

Ofcom's assessment of countervailing buyer power (CBP)

4.34 CBP is the degree of restraint that a purchaser is able to place on the seller by imposing an effective counter on any attempt by the seller to set its prices above the competitive level. In order to rebut the strong presumption of SMP arising from the very high market shares and barriers to entry seen in MCT markets, it is not sufficient for a buyer to have some CBP. The buyer must be able to exert sufficient CBP that a seller is unable to act to an appreciable extent independently of its competitors, customers and ultimately consumers.

4.35 The extent of any CBP that each FCP or MCP will have when negotiating with individual MCPs will vary to some extent, but a detailed analysis of every single bilateral negotiation is impracticable. We therefore consider it appropriate to first assess BT's CBP. As the CAT recognised, it is logical to take BT as the starting point for an assessment of CBP.[141] We then consider the impact that the MTR charged to BT has on the rate paid by others. In line with the H3G Judgment, our analysis

[140] Another CP which does not control a specific mobile number cannot terminate calls to this number because current mobile technology protocols associate a mobile number with a unique subscriber identity on a specific mobile network.
[141] See paragraph 48, Hutchison 3G UK Limited V Ofcom [2008] CAT 11, 20 May 2008 at: http://www.catribunal.org.uk/files/Jdg_CAT11_1083_H3G_200508.pdf

considers whether CBP is sufficient to constrain any SMP that a terminating CP may have.

4.36 BT is the largest transit provider and the largest overall purchaser of MCT. It purchases MCT from the MCPs in every one of the relevant markets identified in Section 3. Its E2E connectivity obligation means that it is interconnected, either directly or indirectly, to each MCP. BT's negotiations with MCPs over MTRs therefore create an important reference point in influencing the behaviour of other originating/transiting CPs and terminating MCPs.

4.37 We consider it unlikely that BT has sufficient CBP to prevent an MCP from being able to act independently of its competitors to an appreciable extent. This is because BT is constrained in its ability to use its own termination rates (or provision of interconnection circuits or other regulated products) as a bargaining chip, since these are constrained by regulation.[142] As noted above, BT is a major provider of network access services in a wider sense (e.g. leased lines are important to many MCPs for backhaul and to support fixed broadband where MCPs diversify their offering into these services). Many of these services are regulated (including on price) so BT's ability to use these as bargaining chips in negotiating MTRs is also constrained.

4.38 The MTR BT agrees with each MCP can act, to some extent, as a 'ceiling' on MTRs for individual bilateral negotiations between originating CPs and terminating MCPs. If a terminating MCP asked for a rate much higher than the rate it had agreed with BT, then other originating CPs have the option of indirect interconnection (i.e. through BT). The cost of indirect interconnection would entail paying BT for transit across part of BT's core network to reach the terminating MCP. So the 'ceiling' to MTRs in direct bilateral negotiations between an originating CP and terminating MCP, should be no higher than the cost of indirect interconnection (i.e. the BT agreed MTR plus any transit charge set by BT).

4.39 The MTR charged to BT may also set a 'floor' for other MTRs. If an originating CP sought a lower MTR than the terminating MCP had agreed with BT, the terminating MCP could refuse this lower rate. This is because the only alternative for the originating CP is to transit via BT and face the already agreed MTR with BT (plus any transit charge levied by BT).

4.40 Moreover, it may not be cost effective for originating CPs to negotiate direct interconnection with smaller MCPs with limited traffic. Hence, where they wish to interconnect with smaller MCPs, originating CPs can direct their traffic through BT and pay the MTRs already agreed between BT and the terminating MCP. In these instances, originating CPs effectively have little or no CBP with respect to smaller MCPs.

4.41 There might be cases where the four largest MCPs could seek to reduce the MTRs they pay to certain smaller MCPs by threatening to block small MCPs' number ranges. However, we consider that commercial incentives for the four largest MCPs to allow their own customers to interconnect universally may weaken attempts to negotiate lower MTRs by threatening to block interconnection with smaller MCPs. Furthermore, the extent to which a blocking tactic can be regarded as legitimate CBP

[142] As noted above, network access and charging conditions imposed both on BT and on other FCPs constrain the exercise of SMP in fixed network call termination markets and prevent them from setting excessive charges in those markets.

for the larger MCPs is unclear. The parties' expectation of Ofcom's potential intervention in these cases (in terms of our current and future views on whether regulatory and industry practices are sufficient to ensure end-to-end connectivity) plays a role in assessing the credible threat of any such practice.

4.42 It appears more common for MCPs to respond by placing numbers from these subscribers outside the retail call bundle – [✂] told us that their number ranges had been affected in this way. However, this appears ineffective as a mechanism to reduce MTRs as shown by our evidence regarding pricing behaviour (see paragraphs 4.48 to 4.54 below). Instead, excluding numbers from the retail bundle tends to pass the higher MTR costs on to the end customer calling that network, which can cause undesirable consumer outcomes, such as higher prices, tariff complexity and bill shock (see Section 5). However, even if it were possible for certain of the four largest MCPs to exercise a degree of CBP, the MTRs charged by smaller MCPs to BT and other originating CPs would still remain high, as there does not seem to be a mechanism by which lower MTRs paid by a large MCP to smaller MCPs would 'spill over' to lower the MTRs charged by the smaller MCPs to other originating CPs.

4.43 We consider, therefore, that *some* of the four largest MCPs might have at most a degree of CBP vis-à-vis smaller MCPs. However, this would not in our view be sufficient to force the MTRs charged by those smaller MCPs to the competitive level for many other originating CPs (including BT and possibly a number of MCPs) which represent the majority of voice traffic.

4.44 Finally, there appears to be little constraint on the MTRs charged by the four largest MCPs themselves. It does not seem feasible for another MCP, particularly for smaller MCPs, to threaten to block such a significant player or to remove calls to their number range from retail bundles. In addition, BT's ability to threaten such action is constrained by its E2E connectivity obligation.

4.45 We therefore believe that CBP is not a sufficient constraint on the strong position of the MCPs in the relevant markets and this is unlikely to change over the period of this market review.

Ofcom's assessment of pricing behaviour

4.46 We first consider the pricing behaviour of the largest four MCPs which have been subject to a charge control, before looking at the pricing behaviour of MCPs with fewer subscribers which, to date, have not.

4.47 Since 2002, the four largest MCPs have been subject to charge controls for MCT (with H3G being subject to a charge control since 2007). Hence, we cannot observe the MTRs which would now be set by these MCPs in the absence of SMP regulation. Nevertheless, we do observe that these MCPs have charged the maximum allowed amount for their MCT service, which suggests that their pricing is likely to have been constrained by regulation. While this behaviour alone does not conclusively imply SMP, it does not contradict the presumption of SMP given market shares or considering other economic factors such as the absence of, or limits to, CBP by originating CPs.

4.48 Prior to 2011, smaller MCPs (i.e. those other than the four largest MCPs) were not subject to SMP regulation. Thus, pricing behaviour prior to 2011 may be indicative of pricing in the absence of SMP regulation (although it is possible that it was constrained by the threat of regulation). As explained in our MCT 2011 Statement,[143] we consider that the pricing behaviour of smaller MCPs is consistent with SMP. In particular, we referred to two disputes in which we had assessed new entrant MCP pricing that was well above the cost estimates we used for those disputes (i.e. the LRIC+ benchmark rates consistent with those set in the March 2007 Statement).[144] Our MCT 2011 Statement also considered pricing data corresponding to that time which indicated that there was a wide variation in the MTRs set by MCPs not subject to SMP regulation. This data included relatively high MTRs compared with the charge control applied on the four largest MCPs at the time.[145]

4.49 In response to our June 2014 Consultation, Telefonica, EE, [✂], Verizon and Virgin Media noted that, despite the F&R charging obligation,[146] some smaller MCPs were charging MTRs significantly above the benchmark rate, i.e. the MTR cap applied to the four largest MCPs. In we summarise the position regarding smaller MCPs' charges based on information from BT's carrier price list (BT's CPL) and MCPs' responses to our formal information requests in November 2014.[147]

[143] See paragraphs 4.48 to 4.54 of the March 2011 Statement.
[144] Ofcom, *Dispute between Mapesbury Communications and T-Mobile about mobile termination rates*, determination and statement, 20 March 2009
http://www.ofcom.org.uk/consult/condocs/mapesbury_tmobile/statement/mcom_deter.pdf
Ofcom, *Dispute between Cable & Wireless and T-Mobile about mobile termination rates*, final determination and statement, 20 May 2009
http://stakeholders.ofcom.org.uk/binaries/enforcement/competition-bulletins/closed-cases/all-closed-cases/cw_01004/cwdispute.pdf
[145] See Table 4.1 in the March 2011 Statement.
[146] In the March 2011 Statement, we imposed an SMP obligation to set charges on a F&R basis on relevant smaller MCPs. A further description of the F&R charging obligation is set out in Section 5.
[147] BT Carrier Price List
https://www.btwholesale.com/pages/static/Library/Pricing_and_Contractual_Information/carrier_price_list/cpl_sectionb1telephony.htm;
Section B1 Telephony part no. 102 'Operator Services (BT to OLO)'
https://www.btwholesale.com/shared/document/CPL/SectionB1_Telephony/B102_10.zip;
Section B1 Telephony part no. 106 'Non Geographic Call Services'
https://www.btwholesale.com/shared/document/CPL/SectionB1_Telephony/b1_06.xls

Table 6: Number of smaller MCPs charging above the benchmark MTR

SMP Condition	March 2011	April 2014	November 2014
Smaller MCPs providing (or planning to provide) voice MCT	28	78 (24)	68
Smaller MCPs charging above benchmark	21	24[148] (5)[149]	24
Smaller MCPs charging 10ppm or more	8	13 (5)	11

Note: Figures in brackets show MCPs that were found to have SMP in the MCT 2011 Statement
Source: MCT 2011 Statement; June 2014 Consultation; BT CPL (as of November 2014); and MCPs' responses to section 135 information requests, September 2014 – November 2014

4.50 The data above shows that as of November 2014, more than a third of smaller MCPs (24) were charging above the benchmark rate based on the estimated cost of 0.845 pence per minute for an average efficient MCP.[150] Indeed, half of those charging above the benchmark had MTRs of 10ppm or more. The April 2014 data in also shows that among the MCPs charging above the benchmark rate are some MCPs designated as having SMP in the last review (and subject to a requirement to set fair and reasonable charges). Prior to recent enforcement action by Ofcom[151], an even greater number of those designated as having SMP had been charging more than the benchmark rate.

4.51 Table 7 below shows all of the MTRs above the benchmark rate.[152] Where an MCP uses a provider of transit and/or hosting services, we have replaced the name of the MCP listed in the BT CPL with the MCP which has been allocated the relevant number range(s).

4.52 The data in also indicates that despite the F&R charging obligation (or the potential threat of regulation for those MCPs not currently subject to SMP regulation) a significant number of smaller MCPs are charging above the benchmark.

[148] In the June 2014 Consultation, we noted that 27 MCPs were charging above the benchmark rate. This included three MCPs that interconnect with BT but, according to their responses to our formal information requests, do not currently have active customers for those number ranges.
[149] These five MCPs are: Core Telecom (up to 10ppm), Euro-Thai Exchange Process Company (up to 10ppm), Mars Communications (up to 12ppm), Telecom 10 (up to 10ppm) and Swiftnet (up to 10ppm).
[150] In 2014/15 prices.
[151] Ofcom opened an own-initiative enforcement programme in October 2013 to determine if those MCPs who were notified as having SMP in 2011 were acting in accordance with our 2011 F&R guidance. Further details at http://stakeholders.ofcom.org.uk/enforcement/competition-bulletins/open-cases/all-open-cases/cw_01115/
[152] The MTRs are sourced from the BT CPL and the associated number range(s).

Table 7: Mobile termination rates for smaller MCPs charging above the benchmark rate, November 2014

Mobile Communications Provider	Number Ranges	MTR (ppm)			Weighted average charge (i)	% premium relative to benchmark MTR(14/15) (ii)	Date MTR was effective from (iii)
		Daytime	Evening	Weekend			
(AQ) Limited	75207	1.5	1.5	1.5	1.5	78%	11/05/12
Andrews & Arnold Limited	74411	1.5	1.5	1.5	1.5	78%	11/05/12
Bellingham Telecommunications Limited	74181	10.0	10.0	10.0	10.0	1083%	01/02/11
CFL Communications Limited	75377	12.0	8.0	4.0	9.0	967%	13/11/08
Citrus Telecommunications Limited	78744	3.0	3.0	3.0	3.0	253%	01/08/11
Cloud9 Communications Limited	77000	15.6	10.8	2.5	11.2	1230%	11/08/06
Cloud9 Communications Limited	78722, 79245,79782-3	11.0	8.7	3.1	8.5	911%	27/11/09
Coms.com	74515	3.0	3.0	3.0	3.0	253%	28/10/11
Confabulate Limited	75595	10.0	10.0	10.0	10.0	1083%	03/11/10
Core Communication Services Limited	75204, 77442-9, 775520, 775522, 775530, 775532-5, 775539-46, 775548-50, 775555	9.1	8.2	2.5	7.3	768%	01/01/14
Core Telecom Limited	75597	10.0	10.0	10.0	10.0	1083%	01/02/11
Esendex Limited	75205	4.5	4.5	4.5	4.5	433%	02/06/11
Icron Network Limited	78225, 79785	3.0	3.0	3.0	3.0	257%	01/04/12
IPV6 Limited	75592	1.5	1.5	1.5	1.5	78%	01/08/12
LegendTel LLC	75591	6.0	6.2	6.4	6.2	632%	18/03/11
Mars Communications Limited	75590	12.0	8.0	4.0	9.0	967%	03/08/10
Moonshado Inc	75899	10.0	10.0	10.0	10.0	1083%	06/07/10
Telecom 10 Limited	78727	10.0	10.0	10.0	10.0	1083%	02/03/11
Sound Advertising Limited	74410	3.0	3.0	3.0	3.0	253%	28/10/11
Sound Advertising Limited	74411	1.5	1.5	1.5	1.5	78%	01/08/12
Spacetel UK Limited	74577	1.5	1.5	1.5	1.5	78%	29/06/12
Swiftnet Limited	78221	10.0	10.0	10.0	10.0	1083%	04/12/08
Telecom2 Limited	74065	10.0	10.0	10.0	10.0	1083%	19/07/10
Truphone Limietd	79788	1.5	1.5	1.5	1.5	78%	01/08/12
Voicetec Systems Limited	74574	1.5	1.5	1.5	1.5	78%	30/08/12
Euro Thai Exchange Process Company Limited	75890, 78933	10.0	10.0	10.0	10.0	1083%	13/11/09

Source: Ofcom analysis based on wholesale charges by number range on the BT carrier price list (as at end of November 2014) and Ofcom data on mobile number allocations. Notes: (i) Weighted by the

proportion of annual minutes in a given time of day, as calculated in 2009/10. In some cases the same MTRs are applied by a MCP across different number ranges; (ii) Comparison is against current MTR charge control ceiling of 0.845 ppm (2014/15 prices) (iii) Where there are different effective dates for number ranges for which the same MTR applies, we selected the most recent effective date.

4.53 Based on the BT CPL, there are some 28 smaller MCPs that have a weighted average MTR above the benchmark rate for at least some of their mobile number ranges. Furthermore, 11 of these MCPs set MTRs at 10ppm or more.[153]

4.54 Therefore, past pricing evidence in the MCT 2011 Statement (discussed in paragraph 4.48 above) and the data we obtained via formal information requests under section 135 of the Act and from the BT CPL suggests that the pricing behaviour of smaller MCPs is consistent with SMP.

Ofcom's conclusion on SMP

4.55 In conclusion, we find that each MCP, including the four largest MCPs and MCPs with fewer subscribers (smaller MCPs), has SMP in the corresponding relevant market. These MCPs are listed in Annex 3.

4.56 This is based on the fact that each MCP has a 100% share of the relevant market and this position had endured throughout the period in which they have operated in this market. In addition, there are high barriers to entry and countervailing buyer power is not sufficient to counterbalance this market power. Pricing evidence is consistent with the absence of competitive pressure.

4.57 EE argued that when considered in the round, competitive constraints (in particular OTT) and other pricing constraints, such as CBP, provide sufficient competitive pressure on MTRs. We disagree with this view. We consider that each of these constraints individually is limited and the combined effect is also likely to be limited during the period of this review. We consider that this is confirmed by the observed pricing behaviour, when MCPs have not been subject to *ex ante* regulation or a charge control.

[153] In Table 7 the number of smaller MCPs charging above the benchmark is 24. Using BT's CPL, we have found 28 MCPs that charge above the benchmark MTR. However, according to their responses to our formal information requests, three of these 28 MCPS are either in liquidation or are dissolved (one of which was charging at 10ppm or above). One further MCP does not presently offer MCT services nor does it plan to do so within this charge control period. Therefore we have not included them in Table 7.

Section 5

Remedies

Summary

5.1 In Section 3 we identified 72 Relevant Markets and in Section 4 we set out our reasons for designating a particular MCP with SMP in each of those markets. In this section we draw our conclusions on the appropriate remedies to address the harm arising from SMP.

5.2 Our decision on the appropriate remedies resulting from SMP is summarised in the table below.

Table 8: Summary of Ofcom's decision on remedies

SMP Condition	Description	Applied to	To be implemented from
M1	Network access obligation (on reasonable request on fair and reasonable terms & conditions)	All MCPs	1 April 2015
M2	No undue discrimination obligation	Four largest MCPs	1 April 2015
M3	Charge control (set using LRIC cost-standard)	All MCPs	Four largest MCPs: 1 April 2015 Smaller MCPs: 1 May 2015
M4	Price transparency obligation	All MCPs	1 April 2015

5.3 The above remedies introduce one significant change to the regulatory regime imposed, compared to the one adopted following the previous review. SMP Condition M3 (charge control) will now apply not only to the four largest MCPs, but to all MCPs found to have SMP. As a result, SMP Condition M1 (network access obligation) no longer refers to "*charges*" within the clause requiring MCPs to provide network access on fair and reasonable terms and conditions, since all MCPs' MTRs will be subject to the charge control.

5.4 The new conditions outlined above will apply from 1 April 2015, except for the charge control condition on smaller MCPs, which will apply from 1 May 2015. With respect to the charge control condition for the four largest MCPs, we have allowed a transition period until 1 May 2015.

5.5 During this period, we require the four largest MCPs to charge MTRs which do not exceed the regulated cap set for the period 1 April 2014 to 31 March 2015, i.e. 0.845ppm. For the same transition period, we would also expect smaller MCPs to charge no more than 0.845ppm (for more details see paragraphs 5.163 - 5.167).

5.6 In the June 2014 Consultation, we consulted on all of the above remedies and in relation to SMP Condition M3 on two specific options: 1) Option A: impose a charge control on all MCPs found to have SMP; and 2) Option B: as in the 2011 MCT review, regulate smaller MCPs' MTRs by requiring them to be fair and reasonable, while imposing a charge control on the four largest MCPs only. We preferred Option A.

5.7 Having considered stakeholders' responses in relation to Options A and B, we believe that Option A (i.e. a charge control on all MCPs) is the most appropriate for regulating MTRs in the next charge control period to March 2018. Our reasoning and analysis in this regard is set out in paragraphs 5.94 - 5.145 below.

5.8 The structure of the remainder of this section is as follows:

5.8.1 We set out our assessment of the harm that would arise in the absence of regulation.

5.8.2 We then discuss the legal background to the imposition of remedies.

5.8.3 We explain the remedies imposed and set out our reasons for this, in light of stakeholders' responses.

The case for regulation: harm arising from SMP and the insufficiency of *ex post* competition law

5.9 In Section 4 of this statement, we concluded that each MCP listed in Table 5 has SMP in its relevant market and therefore that these MCT markets are not effectively competitive. We need to assess the nature and scale of the problems arising from SMP in these markets in order to decide if competition law remedies are sufficient to address the problem and, if not, to impose appropriate *ex ante* remedies.

5.10 In our June 2014 Consultation, we explained that our primary concern is that, without regulation, MCPs will have the incentive and the ability to engage in the following forms of conduct:

- refusal to supply MCT;
- charging excessively high MTRs;
- supplying MCT on discriminatory terms or in discriminatory ways (including price and non-price elements); and
- not providing clarity or certainty in relation to MTRs.

5.11 Respondents generally agreed with our provisional conclusions on the harm arising from SMP and the insufficiency of *ex post* competition law to address it. BT said that the absence of regulation would lead to "*a distortion of competition with a*

corresponding detrimental impact on consumers".[154] H3G noted that, "*irrespective of market structure, high MTRs will act as a price floor on off-net calls, thereby dampening incentives on MCPs to reduce call prices and creating a barrier for MCPs to compete for each other's customers and market shares. […] high MTRs are likely to lead to higher retail prices, lower quality, innovation and investment, and less choice, among other things"*.[155]

5.12 Stakeholders also agreed that *ex post* competition law would not be sufficient to address the harm arising from SMP in MCT markets. BT submitted that:

> *"[…] both the current UK circumstances and the European framework continue to justify the imposition of ex ante regulation. Ex post competition law is by definition reactive and would not address the competition and welfare issues which Ofcom has identified in the Consultation (and previous mobile termination market reviews). On-going regulation therefore remains appropriate to counteract the incentives MCPs have to raise rates and increase regulatory certainty for all communications providers."*[156]

5.13 A confidential respondent [✂] said that:

> *"Whilst, broadly speaking, deregulation in a truly competitive market is something [✂] supports and we note that this is an overarching objective of the prevailing European Directives, this can only be considered where the potential harm is not irreversible in the timescales and scope of the relevant ex-post competition law…the market in question is both part of the European Commission defined markets for ex-ante regulation and is clear from Ofcom's analysis that it could be abused due to its monopolistic characteristics and is clearly a candidate for such regulation regardless."*[157]

5.14 In relation to no undue discrimination, EE however argued that unduly discriminatory behaviour should be addressed by *ex post* competition law because any such conduct is best assessed within the specific circumstances in which it is taking place. We discuss this specific point in paragraph 5.83.

5.15 In the absence of regulation any of the forms of conduct listed at paragraph 5.10 above could manifest itself, in isolation or in combination with others. We explain below in turn how these forms of conduct lead to harm and conclude by assessing why *ex post* competition law would not be sufficient to remove it. The extent of each of the harms discussed is likely to be proportionate to the size of the relevant MCP's customer base. Nevertheless, we consider that harm would also arise from smaller MCPs engaging in these forms of conduct.

[154] Paragraph 3.4 BT's response to the June 2014 Consultation.
[155] Page 4 of H3G's response to the June 2014 Consultation.
[156] Paragraph 3.7 of BT's response to the June 2014 Consultation.
[157] [✂]

Ofcom's assessment of refusal to supply MCT

5.16 In the absence of a requirement to provide network access to other CPs on fair and reasonable terms, MCPs could refuse access to their network or provide access subject to unreasonable terms.

5.17 An originating CP whose interconnection request is rejected by an MCP, or made subject to unreasonable terms, would not be able to connect its customers to customers of that MCP or would only be able to do so in a way which was likely to impair the service it offers, thereby harming the originating CP's customers. Refusals to interconnect, or the provision of interconnection on unreasonable terms, could also impede effective competition and thus, by extension, further harm end-customers.

5.18 An originating CP whose interconnection request is rejected or made subject to unreasonable terms may rely instead on transit providers. This would reduce the harm from such refusal to some extent, but the CP may have preferred to connect directly with the MCP withholding access – for example, because it would lower its end-to-end cost of providing calls. If the higher costs of using a transit provider are passed on to consumers, this could lead to consumer harm. Also, the terminating MCP may refuse to provide access on fair and reasonable terms to one or more transit providers.

Ofcom's assessment of excessively high MTRs

5.19 As we noted during our previous market review,[158] while some academic literature suggests that, in the absence of regulation, MTRs could be set at or even below marginal costs – in particular for mobile-to-mobile calls – ultimately the policy recommendations within the literature are heavily dependent on various, and sometimes quite different, assumptions.[159]

5.20 We have also noted in the previous section (paragraphs 4.46 - 4.54) the market evidence which supports our view that MTRs are likely to be set at excessively high levels absent regulation.

5.21 If MCPs set excessive MTRs, they may be able to earn economic profits for that service (i.e. returns above their cost of capital). These profits from MCT could be "returned" to consumers through competition at the retail level in the form of incentives to buy mobile services – such as lower retail call prices and/or handset subsidies.

5.22 We consider that even if there were full "recycling" of higher MTRs into lower retail tariffs (which we do not believe to be the case), excessive MTRs could still harm consumers' interests by distorting competition in downstream retail markets. Excessive MTRs also affect economic efficiency and have distributional impacts.

5.23 These arguments are summarised below and set out in more detail in Section 6. While the discussion in Section 6 is focused on the choice of cost-standard for setting

[158] See paragraphs 5.15 to 5.30 of our April 2010 Consultation.
[159] The results depend on whether MCPs set their MTRs cooperatively or unilaterally, the nature of retail competition, and the presence or absence of call externalities. For an overview of this literature, see Armstrong, M & Wright, J (2009) http://ideas.repec.org/a/ecj/econjl/v119y2009i538pf270-f307.html, Royal Economic Society, vol. 119(538), pages F270-F307, 06.

a cost-based cap on MTRs, the arguments in relation to higher cost-based MTRs would also generally apply, indeed yet more so, to "high" MTRs such as those likely to prevail absent regulation of SMP (or the threat of such regulation).

Competition concerns caused by high MTRs

5.24 The power to set high MTRs in the absence of regulation will affect competition in retail mobile markets. We agree with H3G that not all these effects depend directly on the market share of the MCPs and that even if all MCPs have equal market shares this does not necessarily eliminate the risk of distortion to existing competition.[160] Without regulation, the resulting high MTRs are likely to create barriers to entry or expansion – and while this is likely to be particularly felt by smaller players, it is also likely to affect the intensity of competition among larger MCPs. The mechanisms by which unregulated MTRs would affect other MCPs (termed "retail effects", "market-wide effects" and "customer segments effects" in the MCT 2011 Statement) are described in Section 6 below.

5.25 Competition concerns arising from high MTRs are not limited to the conduct of the four largest MCPs. Competitive harm may also arise if smaller MCPs set higher (asymmetric) MTRs with the intention of discounting their retail offers and thereby gaining a competitive advantage. The competition harm from asymmetric MTRs is one of the important factors cited in the Explanatory Note to the 2009 EC Recommendation on the regulatory treatment of fixed and mobile termination rates.[161] While smaller MCPs remain small this potential competitive distortion would be limited, but insofar as asymmetric MTRs allow smaller MCPs to grow their subscriber bases more than they otherwise would, there remains a risk of a material competitive distortion.

5.26 If MCPs were to set excessive MTRs while fixed call providers (FCPs) were able only to charge regulated (cost-oriented) fixed termination rates (FTRs), this would result in a transfer of funds from FCPs to MCPs. In a situation where FCPs and MCPs compete with one another to some degree this would also distort competition. We discuss competition between MCPs and FCP further in Section 6 (paragraphs 6.152 - 6.159).

Economic inefficiency caused by high MTRs

5.27 We said in our June 2014 Consultation that, even if excessive profits from MCT were fully competed away, the resulting structure of prices in retail and wholesale markets was likely to be *inefficient*, distorting consumer choice and harming consumers' interests.[162] Some services would be consumed more than would be efficient and others consumed less than would be efficient (compared to the situation of prices reflecting actual resource costs). We remain of this view.

5.28 Examples of this include:

---

[160] See page 4 of H3G's response to the June 2014 Consultation.
[161] See paragraph 3.1.3, Commission Staff Working Document accompanying the Commission Recommendation on the Regulatory Treatment of Fixed and Mobile Termination Rates in the EU, Explanatory note, 7 May 2009 ('Explanatory Note to the 2009 EC Recommendation'), available at http://ec.europa.eu/smart-regulation/impact/ia_carried_out/docs/ia_2009/sec_2009_0600_en.pdf
[162] See paragraphs 5.23-5.24 of the June 2014 Consultation.

- The price of calls to mobiles from fixed lines would be relatively high and other charges for mobile services (such as monthly access fees) relatively low. This structure of prices could lead to over-consumption of mobile retail services and under-consumption of other retail services that use MCT, such as fixed-to-mobile calls.

- Even with respect to mobile-to-mobile calls, excessive MTRs would create distortions. Because MTRs are an important part of the perceived[163] marginal cost of mobile-to-mobile calls between CPs (i.e. off-net calls), high MTRs are likely to lead to higher prices for off-net calls than for on-net calls, thereby distorting consumer choice between the two call types or creating a risk of consumer confusion (if the operator charging high MTRs is placed out of bundle by originating MCPs). Where MCPs price on-net and off-net calls the same at the retail level, the "break-even" call price of an originating MCP will be higher if other MCPs' MTRs are at excessive levels.[164]

Ofcom's assessment of discriminatory supply of MCT

5.29 A discriminatory supply of MCT could take both price and non-price forms. Incumbent MCPs could exert their SMP to exclusionary effect in the absence of regulation through discriminatory treatment of other CPs, such as smaller MCPs. For example, they could charge higher MTRs and/or provide an inferior quality-of-service to new entrant MCPs or smaller MCPs in order to create barriers to entry or expansion for such players.

Ofcom's assessment of the lack of clarity and certainty in relation to MTRs

5.30 A lack of price transparency would allow terminating MCPs to engage in bespoke pricing to different originating CPs. Such conduct may facilitate the exploitation of market power in termination, either by extracting greater revenue from originating CPs and/or by facilitating certain forms of exclusionary pricing (e.g. price discrimination against new market entrants or smaller MCPs). While in theory setting a different price to every buyer may be efficient (if the marginal customer pays at incremental cost), such pricing could result in a large transfer of economic surplus from buyers to suppliers. Even if some of this surplus from MTRs is competed away in retail markets, such forms of pricing in MCT (which is a wholesale market) may distort competition and or efficient consumer behaviour.

5.31 A lack of reasonable clarity or certainty with respect to MTRs also means that originating or transit CPs who need to purchase MCT face cost uncertainty – particularly if other forms of price regulation are not in place. This increase in risk – caused by uncertainty over forward-looking MTRs – could lead to consumer harm if CPs who need to purchase MCT mitigate that financial risk by increasing their own prices. Originating CPs may react to such financial risk by excluding from their call allowances/bundles calls made to mobile numbers which incur unclear or uncertain MTRs. This could then result in undesirable consumer outcomes, such as tariff

[163] Throughout, we use the phrase 'perceived' to distinguish the costs of off-net termination (as faced by originating CPs when they pay MTRs to other operators), from the 'true' marginal (or incremental) cost of termination which is the cost incurred by the operator providing the termination service.
[164] By "break-even" we mean at least covering the end-to-end incremental costs of the call. When MTRs are above incremental cost, the end-to-end cost for off-net calls will be above that for on-net calls.

complexity and/or, potentially, bill shock. Lack of certainty may also deter entry by new MCPs.

Ofcom's assessment on the sufficiency of *ex post* competition law

5.32 Before considering *ex ante* regulation (i.e. SMP conditions) to remedy the problems arising from SMP in MCT markets, we must determine if competition law remedies would be sufficient to address these problems. This is because *ex ante* regulation should only be imposed where competition law remedies are insufficient to address the competition problem(s) identified.[165]

5.33 Generally, the case for *ex ante* regulation in communications markets is based on the existence of market failures which, by themselves or in combination, mean that competition might not be able to become established if the regulator relied solely on its *ex post* competition law powers. Therefore, in the presence of market failures, it is typically appropriate for *ex ante* regulation to be used to address these market failures and any barriers to entry that might otherwise prevent effective competition from becoming established within the relevant market(s) we have defined.

5.34 In general, by imposing *ex ante* regulation that promotes competition it may be possible to reduce such regulation over time, as markets become more competitive, allowing greater reliance on *ex post* competition law. In MCT markets, however, the nature of the problem is one of persistent market power. Each company operates in a distinct market where there are considerable barriers to entry.[166] The scale of the problem which would arise in the absence of any regulation justifies *ex ante* intervention. The Explanatory Note to the 2014 EC Recommendation says that, given the crucial importance of guaranteeing effective and timely interconnection, *ex post* competition law alone is not able to address bottlenecks in termination markets; consequently, the use of *ex ante* regulation "*appears indispensable, at least for the time being*".[167] We agree with this proposition.

5.35 Imposing obligations on an *ex ante* basis allows consistent and timely intervention. Moreover, some problems can only be remedied effectively by means of *ex ante* SMP conditions and, in our view, cannot be remedied adequately under *ex post* competition law. This particularly applies where fair and reasonable access to the infrastructure of competing firms is important to the competitive process and/or where competition in related markets has come about because of prior *ex ante* regulation and where technology and/or demand conditions are unlikely to support commercially viable alternatives.

5.36 It follows from the above that *ex post* competition law is unlikely by itself to bring about or promote effective competition as it focuses on past abuses of dominance. In contrast, *ex ante* regulation is normally aimed at actively promoting the development of effective competition going forward through attempting to reduce the level of market power or dominance in the identified relevant market(s).

---

[165] Recital 27 of the Framework Directive.

[166] With the technology available today, for example, it is difficult for a potential competitor to terminate voice calls on a UK mobile number owned and controlled by another MCP without incurring the MTR of that MCP. OTT services offer alternative ways to terminate a voice call on a mobile handset but use other means to identify the recipient, e.g. the recipient logs in to the OTT service via username and password. In Section 3, paragraph 3.44 - 3.62 we provide more details in relation to OTT and our reasons for considering OTT outside the relevant MCT markets in this review.

[167] Page 31 and 32 of the Explanatory Note to the 2014 EC Recommendation.

5.37 Imposing obligations on an *ex ante* basis also provides stakeholders with greater legal and regulatory certainty which we consider appropriate in the particular context of the widespread impact of the potential detriments stemming from market power discussed above. This certainty is linked to the fact that the SMP conditions (set out in Annex 3) would enable us to intervene quickly if required. Also, greater regulatory certainty would support competition as it would facilitate investment by competing CPs to advance their business propositions.

5.38 It is also not necessarily the case that deregulation and reliance on *ex post* competition powers would reduce the regulatory burden on stakeholders. The absence of *ex ante* regulation may, for example, increase the risk of commercial negotiations failing.

Overall conclusion on the harm arising from SMP absent regulation and insufficiency of *ex post* competition law

5.39 With regard to the period considered in this market review, we conclude that – in the absence of regulation – MCPs have the ability and incentive to set excessive MTRs as well as act in other ways that would harm competition and result in consumer detriment. Absent regulation, such conduct would result in a structure and level of prices, in retail and wholesale markets, that would be less efficient, distort customer choice, restrict or distort competition and may generate adverse distributional impacts.

5.40 We also find that *ex post* competition law, under Article 102 of the EU Treaty and Chapter II of the Competition Act 1998, would be insufficient to address the lack of effective competition in the markets defined in Section 3 and prevent the problems we have identified above. Therefore, we consider that *ex ante* regulation is required.

Legal background to the imposition of remedies

5.41 There are a number of legal tests we need to consider when imposing remedies on MCPs designated as having SMP.

5.42 Section 87(1) of the Act provides that, where Ofcom has made a determination that a person has SMP in a particular market, it must set such SMP services conditions as it considers appropriate and as are authorised under the Act. Section 87(1) implements Article 8 of the Access Directive and Article 16(4) of the Framework Directive.

5.43 Paragraphs 21 and 114 of the SMP Guidelines state that NRAs must impose one or more SMP services conditions on an undertaking having SMP, and that it would be inconsistent with the objectives of the Framework Directive not to impose any SMP services conditions on an undertaking which has SMP.

5.44 Sections 45-49 and 87-91[168] of the Act set out the obligations that Ofcom can impose if it finds that any undertaking has SMP (SMP services conditions). They comprise obligations of access to and use of specific network elements, transparency, non-discrimination, accounting separation, price control and cost accounting.

[168] Sections 87-91 implement Articles 9 to 13b of the Access Directive and Article 17 of the Universal Services Directive.

5.45 SMP services conditions must be appropriate (section 87(1) of the Act) and must satisfy the tests set out in section 47(2) of the Act. These are that each condition must be: (a) objectively justifiable in relation to the networks, services, facilities, apparatus or directories to which it relates; (b) not such as to discriminate unduly against particular persons or against a particular description of persons; (c) proportionate to what the condition or modification is intended to achieve; and (d) in relation to what it is intended to achieve, transparent.

5.46 We must also act consistently with our general duties under section 3 of the Act, including our principal duty to further the interests of citizens and to further the interests of consumers where appropriate by promoting competition (see further Annex 1, paragraphs A1.24 to A1.28).

5.47 Section 4 of the Act sets out the six Community requirements on Ofcom which flow from Article 8 of the Framework Directive (see further Annex 1, paragraphs A1.29 to A1.31). We consider that the first five of these requirements[169] are of particular relevance to this market review and that no conflict arises in this regard with those specific objectives in section 3 of the Act that we consider are relevant.

5.48 In considering what remedies are appropriate, we have taken into account these duties. In particular, we have considered the requirement to promote competition in relation to the provision of electronic communications networks and electronic communications services.[170]

5.49 In carrying out its functions under this review, Ofcom is required by section 4A of the Act to take due account of applicable recommendations issued by the EC under Article 19(1) of the Framework Directive. Pursuant to Article 3(3) of the BEREC Regulation,[171] Ofcom must take utmost account of any relevant opinion, recommendation, guidelines, advice or regulatory practice adopted by BEREC. Insofar as it is relevant to the remedies under consideration, we have therefore taken due account of the applicable EC recommendations, including the 2009 EC Recommendation, and utmost account of the applicable opinions, recommendations, guidelines, advice and regulatory best practices adopted by BEREC relevant to the matters under consideration.

5.50 Specific legal requirements may also need to be satisfied, depending on the SMP condition in question. For example, in determining whether a dominant MCP should be obliged to provide network access, we must take into account factors including the feasibility of the provision of the network access, the investment of the MCP initially

[169] In summary, the first five Community requirements are: 1) to promote competition in communications market; 2) to ensure that Ofcom contributes to the development of the European internal market; 3) to promote the interests of all European Union citizens; 4) to act in a manner which, so far as practicable, is technology-neutral; 5) to encourage, to the extent Ofcom considers it appropriate, the provision of network access and service interoperability for the purposes of securing efficiency and sustainable competition in communications markets and the maximum benefit for the customers of communications network and services providers.
[170] See Art 4(3)(a) of the Act.
[171] Regulation (EC) No 1211/2009 of the European Parliament and of the Council of 25 November 2009 establishing the Body of European Regulators for Electronic Communications (BEREC) and the Office, 25 November 2009. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:337:0001:0010:EN:PDF

providing or making available the relevant network and the need to secure effective competition in the long term.[172]

5.51 We can only impose a price control where it appears to us from our market analysis carried out for the purpose of setting the condition that there is a relevant risk of adverse effects arising from price distortion, and that the setting of the condition is appropriate for the purposes of:

- promoting efficiency;
- promoting sustainable competition; and
- conferring the greatest possible benefits on the end-users of public electronic communications services.[173]

5.52 For these purposes, there is a relevant risk of adverse effects arising from price distortion and lack of effective competition if the dominant MCP might set and maintain prices at an excessively high level, or impose a price squeeze, with adverse consequences for end-users.

5.53 In setting a charge control, we must also take account of the extent of the investment in the matters to which the condition relates, by the MCP to whom it is to apply.[174]

5.54 In the following sub-sections we set out in sequence the remedies we consider are required to address the problems resulting from SMP identified above. We summarise stakeholders' responses in relation to each remedy and provide our analysis in response to their comments.

5.55 While considering each remedy we set out our conclusions as to whether it should apply to all MCPs or only to the four largest MCPs. This is because the retail position of the four largest MCPs is substantively different from that of smaller MCPs and so are the consequences of the exercise of their SMP.

Network access obligation

5.56 As explained earlier, we consider that in the absence of a requirement to provide network access to other CPs on fair and reasonable terms, MCPs would have the ability and could have the incentive not to grant access to their network or to grant access subject to unreasonable terms. Such conduct would lead to consumer harm if a CP finds it difficult or impossible to connect its customers to the customers of an MCP withholding access on reasonable terms, and there might also be effects on competition.

Proposals in June 2014 Consultation

5.57 For the reasons stated above, in our June 2014 Consultation we proposed that a general network access obligation applied to all MCPs with SMP to protect end-to-end connectivity.

---

[172] Section 87(4) of the Act and Article 12(2) of the Access Directive.
[173] Section 88 of the Act and Article 13 of the Access Directive.
[174] Section 88(2) of the Act and Article 13(1) of the Access Directive.

5.58 We also said that, if we were to give effect to the proposal to impose a charge control on all MCPs found to have SMP, then the network access obligation would no longer make reference to *"charges"*. MCPs, however, would still have an obligation to provide network access on fair and reasonable terms and conditions and would also be required to be compliant with the charge control condition.

Stakeholders' responses to consultation

5.59 All respondents to the June 2014 Consultation agreed with our proposal to impose a network access obligation on all MCPs. Telefonica and Vodafone, however, argued that the reference to "*charges*" should be retained as part of this obligation.

5.60 Telefonica argued specifically that Ofcom should retain its power to set MTRs below the regulated cap in the context of a dispute about fair and reasonable charges because this would allow Ofcom to keep its flexibility in setting lower charges for those MCPs that incur lower costs in the provision of MCT, i.e. asset-light MCPs.[175] According to Telefonica, the lack of such flexibility would provide incentives on MCPs to use the additional revenues from MCT to fund international call forwarding services or revenue sharing arrangements. Consequently, originating MCPs may react by excluding calls to such services from retail call bundles which would harm consumers' interests. Telefonica also noted that under the 2011 regulatory regime the four largest MCPs were required to comply with both the regulated charge control cap on MTRs and with the obligation to provide network access on fair and reasonable terms and conditions, including charges.

5.61 Vodafone commented that it may be more appropriate to consider the charge control imposed on the large MCPs to be a ceiling, and that, depending on the circumstances, the charge control for a smaller MCP could be set lower than that benchmark.[176] Vodafone did not elaborate on the ways for achieving this.

Ofcom's conclusion

5.62 All MCPs that were found as having SMP in the MCT 2011 Statement have been required to provide network access on reasonable request (condition M1.1) on fair and reasonable terms and conditions, including charges (condition M1.2).[177] Those MCPs who were made subject to a charge control were also required to comply with that condition (condition M1.3). All MCPs with SMP have been required to comply with any direction made by Ofcom under condition M1 (condition M1.4).

5.63 In 2011 we considered that the obligation to provide network access on fair and reasonable terms and conditions, including charges, accompanied by guidance as to our interpretation of "fair and reasonable"[178] was likely to be sufficient to limit the MTRs charged by smaller MCPs.[179]

5.64 Having considered stakeholders' responses to the June 2014 Consultation, we remain of the view that a general network access obligation is necessary to ensure

[175] See response to question 5.7 on page 4-5 of Telefonica's response to the June 2014 Consultation.
[176] See page 94 of Vodafone's response to the June 2014 Consultation.
[177] Annex 1 of the March 2011 Statement.
[178] Ofcom, *Wholesale mobile call termination: Guidance on dispute resolution in relation to fair and reasonable charges*, statement, 5 April 2011, ('2011 F&R Guidance'), available at http://stakeholders.ofcom.org.uk/binaries/consultations/mtr/statement/guidance.pdf
[179] Paragraphs 6.22 and 6.88 of the March 2011 Statement.

end-to-end connectivity and should apply to all MCPs with SMP. Therefore, we have decided to retain an SMP condition that requires all MCPs with SMP to provide network access on reasonable request on fair and reasonable terms and conditions.

5.65 We remain of the view that, as we have now decided to impose a charge control on all MCPs found to have SMP (see our conclusions set out in paragraphs 5.105 - 5.106 and 5.136 - 5.137), it is appropriate to remove the reference to charges within the clause requiring MCPs to provide network access on fair and reasonable terms and conditions because all notified MCPs will be required to be compliant with the charge control condition. Preserving the reference to "*charges*" could create regulatory uncertainty for CPs in a situation where a charge control also applies to all MCPs found to have SMP. A charge control applying to all MCPs prohibits MTRs above the cap, therefore it renders redundant the need for the fair and reasonable clause to function as an upper limit.

5.66 We recognise that the new formulation of the network access obligation may result in Ofcom losing flexibility in relation to setting lower MTRs for asset-light MCPs. However, on balance we believe that this approach will be the most effective in minimising the potential harm to competition and consequently the most beneficial to consumers. We give further consideration to the points raised by stakeholders in this respect in paragraphs 5.113 - 5.119 below.

5.67 We also note Telefonica's comment that following the MCT 2011 Statement, the four largest MCPs were subject to both the charge control and the clause on fair and reasonable terms and conditions including charges and this did not generate uncertainty or confusion. However, we are now extending the charge control to 68 smaller MCPs with very different sizes and business models. Of these, 24 charge above the regulated MTR. We consider that removing the reference to "charges" within the fair and reasonable clause provides regulatory certainty to all notified MCPs because it makes it clear that it is not permitted to charge above the MTR cap in any circumstance.

5.68 Part 3 of Schedule 2 in Annex 3 sets out the network access obligation (Condition M1).

Legal tests

5.69 Section 87(3) of the Act authorises the setting of SMP services conditions requiring the dominant provider to provide network access, as Ofcom may from time to time direct. These conditions may, pursuant to section 87(5), include provision for securing fairness and reasonableness in the way in which requests for network access are made and responded to, and for ensuring that the obligations in the conditions are complied with within the periods and at times required under the conditions. When considering the imposition of such conditions in a particular case, Ofcom must have regard to the six factors set out in section 87(4) of the Act. In imposing this condition we have taken into account all of these factors (in particular the technical and economic viability of installing other competing facilities and the feasibility of the network access and the need to secure effective competition in the long term).

5.70 We do not consider it to be technically or economically feasible to install competing facilities for the purpose of providing call termination services to a particular MCP's end users in the period considered by this review. However, given that MCPs are currently providing network access of the type envisaged by this condition (that is, terminating voice calls to numbers within the relevant market), Ofcom considers that

provision of network access is feasible. We also consider that the condition will help to secure effective competition in the long term as it will ensure that purchasers of MCT are not disadvantaged in the retail market by the imposition of unreasonable terms and conditions by terminating MCPs.

5.71 We consider that this condition meets the criteria set out in section 47(2) of the Act because it is:

i) objectively justifiable, in that it has the aim of ensuring that call termination services are provided by all MCPs, such that competition develops to the benefit of consumers;

ii) not unduly discriminatory, in that it applies equally to MCPs which, in our view, hold a position of SMP;

iii) proportionate, because it is the least restrictive means of ensuring that MCPs are unable to refuse to provide network access to their wholesale call termination services to other CPs in that it does not require MCPs to provide access if the request is unreasonable; and

iv) transparent, in that the condition is transparent in its operation and has been accompanied (in this document) by an explanation of its intended operation and effect.

5.72 We have considered our duties under section 3 of the Act. We consider that this condition furthers the interests of consumers in relevant markets by the promotion of competition because it prevents MCPs from (i) denying network access with the intention of deterring entry or reducing competition and (ii) providing network access subject to unreasonable terms with the intention of reducing competition.

5.73 We consider that this condition meets the Community requirements set out in section 4 of the Act (in particular the requirements to promote competition in the provision of electronic communication networks and electronic communication services, to encourage network access for the purpose of securing efficient and sustainable competition and the maximum benefit for retail consumers).

No undue discrimination obligation

5.74 In the June 2014 Consultation, we proposed a no undue discrimination obligation on the four largest MCPs in order to protect competition. We thought however that it would not be appropriate to extend this obligation to smaller MCPs because any potential discriminatory conduct from them would have a very limited impact on competition, due to their small customer base and consequently small traffic volumes.

Stakeholders' responses to consultation

5.75 BT agreed with our proposition to impose a no undue discrimination obligation only on the four largest MCPs. It said that there is no practical or theoretical reason to consider that smaller MCPs would be able to gain any material advantage through such discrimination given their relative size in the market. According to BT, extending such an obligation "*would not be in line with the statutory obligation to impose*

regulation only where it is proportionate and targeted only at cases in which action is needed".[180]

5.76 EE argued that an obligation not to unduly discriminate is unnecessary and imposing it only on some MCPs may "*unnecessarily restrict pro-competitive behaviour*". It considered that unduly discriminatory conducts can be best addressed by *ex post* competition law because any such conduct should be assessed within the specific context in which it is taking place.[181]

5.77 Vodafone agreed with our proposal that the four largest MCPs be subject to a no undue discrimination obligation but argued that such condition should also be extended to smaller MCPs. In Vodafone's view, Ofcom does not appear to have considered the cumulative adverse effect on competition and consumers of a number of smaller MCPs.[182]

5.78 One confidential respondent [✂] argued that the lack of examples of alleged discrimination regarding smaller MCPs does not give sufficient cause to limit the non-discrimination obligation to the four largest MCPs. It said that this prohibition should apply to all MCPs regardless of size.[183]

Ofcom's conclusion

5.79 We discuss the potential concerns from discriminatory conduct first in relation to the four largest MCPs and, second, in relation to the smaller MCPs.

Four largest MCPs

5.80 We consider that, in the absence of a no undue discrimination obligation, the potential for discrimination with adverse effects on competition will still exist in the supply of MCT by the four largest MCPs. Absent a charge control, there could be significant scope for discriminatory pricing (as well as unduly discriminatory conduct). While a charge control may reduce the scale of possible price discrimination, it does not eliminate the incentive or ability to price discriminate (only the potential degree of divergence in prices).

5.81 MCPs may still charge purchasers of MCT different MTRs below the charge-controlled MTR cap with the intention and/or the effect of reducing competition and/or deterring entry. Charging different MTRs to different MCPs may distort competition in specific segments of the retail market, e.g. if two or more of the larger MCPs were to enter into a B&K agreement between themselves, but charge competing MCPs an MTR, they may be at an advantage for customers with more MTM outbound than inbound traffic which could damage competition. We would also be concerned if the largest MCPs price discriminated by charging well below the cap for M2M traffic (in the limit at zero), but charged an MTR up to the cap for traffic originated from fixed (and international) CPs. This could distort pricing, consumption and competition between fixed and mobile voice calls.

[180] Page 14-15 of BT's response to the June 2014 Consultation.
[181] Page 62 of EE's response to the June 2014 Consultation.
[182] Page 94-95 of Vodafone's response to the June 2014 Consultation.
[183] [✂]

5.82 Discrimination may also take a non-price form if, for example, one or more of the four largest MCPs restricted some service features for voice calls which are terminated to their mobile number ranges and which originate from other MCPs. We consider that such discriminatory behaviour could impede the ability of competing CPs to offer established for services or new and innovative services in relation to the provision of voice termination and thus distort competition.

5.83 In paragraphs 5.32 - 5.38 above we discussed why we believe that the application of *ex post* competition law would not be sufficient to address the potential harm arising from anticompetitive conducts in the absence of any *ex ante* regulation. We believe the same arguments are applicable in this context. Even with the imposition of a network access, price transparency and charge control obligations on the four largest MCPs an absence of a no undue discrimination obligation may incentivise forms of conduct by them which could harm competition and could not be appropriately addressed by relying solely on *ex post* competition law. This is because the latter only focuses on past abuses of dominance and may not always allow for timely intervention.

5.84 For the above reasons and in line with our consultation proposals, we conclude that it is appropriate to maintain the no undue discrimination obligation for the four largest MCPs.

Smaller MCPs

5.85 In light of stakeholders' comments, we have also considered whether an obligation of no undue discrimination should apply to smaller MCPs. We believe that the competitive positions of the smaller MCPs and their relatively smaller customer bases mean that any potential discriminatory conduct would not pose a significant risk to effective competition.

5.86 In response to Vodafone's point, we also consider that the potential cumulative adverse effect on competition of a number of smaller MCPs engaging in discriminatory behaviour would still likely be insignificant. This is because the total MCT traffic generated by all smaller MCPs represents only 2.2% of the total MCT traffic.

5.87 As we noted in our June 2014 Consultation, smaller MCPs have not previously been subject to a no undue discrimination obligation and no complaints suggesting discriminatory conduct by them have been submitted to us. In addition, no respondent to the June 2014 Consultation provided evidence and/or examples of such anticompetitive behaviour.

5.88 We therefore conclude that, on balance, for the period of this review it would not be objectively justified or proportionate to impose an obligation of no undue discrimination on smaller MCPs in addition to their network access obligation, price transparency obligation and charge control obligation (see paragraphs 5.136 - 5.137 below).

5.89 Part 3 of Schedule 2 in Annex 3 sets out the no undue discrimination obligation (Condition M2).

Legal tests

5.90 Section 87(6)(a) of the Act authorises the setting of an SMP services condition requiring the dominant provider not to unduly discriminate against particular persons,

or against a particular description of persons, in relation to matters connected with the provision of network access.

5.91 We consider that imposing this condition on the four largest MCPs meets the criteria set out in section 47(2) of the Act because it is:

i) objectively justifiable, in that it provides safeguards to ensure that competing CPs, and ultimately consumers (who would gain from more effective competition), are not disadvantaged by one of the four largest MCPs unduly discriminating among them;

ii) not unduly discriminatory, in that it does not discriminate unduly against any MCP and it is proportionate to what it is intended to achieve. As discussed above in paragraphs 5.85 - 5.89, we consider it appropriate that this condition be imposed on the four largest MCPs only. The competitive position of the four largest MCPs is such that we are concerned about the resultant impact of any discriminatory conduct by them on the retail market. While other designated MCPs could also engage in discriminatory practices, their weaker competitive position means that we have fewer grounds for concern in this respect as they are in a different position to the four largest MCPs;

iii) proportionate, in that it safeguards against price and non-price discrimination with potential exclusionary effects, but is the least burdensome means of doing so; and

iv) transparent, in that it has been drafted so as to secure maximum transparency, which is aided by the explanation as to the intended operation and effect of the conditions, as set out in this document.

5.92 We have considered our duties under section 3 of the Act. We consider that this condition furthers the interests of consumers in relevant markets by the promotion of competition because it ensures that other CPs (including smaller MCPs) are not disadvantaged in the provision of access to MCT by the four largest MCPs. By ensuring that competing CPs are not discriminated against so as to materially affect their ability to compete, the condition helps to secure effective and sustainable competition and furthers the interests of consumers.

5.93 We consider that this condition meets the Community requirements set out in section 4 of the Act (in particular, the requirement to promote competition in the provision of electronic communications networks and electronic communications services, and to encourage network access for the purpose of securing efficient and sustainable competition and the maximum benefit for customers of CPs).

Charge control obligation

5.94 We have set out earlier in this section the competitive and consumer harm that we would expect to result if MCPs were free to set unregulated MTRs. We explain below why we consider that some form of charge control is required to prevent excessively high MTRs.

Proposals in June 2014 Consultation

5.95 In the June 2014 Consultation we proposed that a charge control should apply to the four largest MCPs. In the absence of an MTR charge control the four largest MCPs

would have the incentive and the ability to charge excessive MTRs – even if they were subject to the other three remedies discussed in this section.

5.96 With regard to the smaller MCPs, we consulted on two options:

- **Option A**: We impose a charge control on all MCPs found to have SMP; and
- **Option B**: As now, we regulate smaller MCPs by requiring them to charge F&R MTRs (while we impose a charge control on the four largest MCPs only).

5.97 We also indicated that, on balance, on the basis of the evidence and the reasoning presented in the June 2014 Consultation, our preferred option was Option A because we considered that imposing a charge control on all MCPs who have SMP would be more effective than the F&R approach in remedying the harm caused by excessive MTRs.

Stakeholders' responses

5.98 Most respondents to the June 2014 Consultation agreed with our proposal to impose a charge control on all MCPs with SMP. BT said that making all MCPs subject to the same cap improves regulatory certainty and reduces the requirements for costly regulatory monitoring and potential disputes. [✂] said that the fair and reasonable regime which is currently in place has had no effect on addressing the harm that can potentially be perpetrated by MCPs.[184] It also noted the EC's support under the 2013 FNMR for extending the charge control to all smaller CPs.

5.99 EE, however, disagreed with our proposal to have a single regulated MTR cap and suggested that our regulation should be based on a two-cap MTR system. EE argued that all smaller MCPs should be regulated at a lower rate to reflect their lower cost base and should only be permitted to move to the higher MTR benchmark if they are able to demonstrate to Ofcom that this is justified on the basis of their efficiently incurred costs.[185] In EE's view, the administrative costs of such a process are likely to be less than the costs from distorted competition and lost consumer surplus.

5.100 EE also noted that based on the evidence presented by Ofcom payments to smaller MCPs at the maximum MTR benchmark amount to an overpayment above the FTR benchmark of approximately £4.46 million per annum.

5.101 Telefonica and Vodafone commented that Ofcom should retain its power to set lower MTRs in the context of a dispute about fair and reasonable charges.

5.102 Two smaller MCPs, [✂], offering call services using UK mobile numbers including calls where either the caller or the called party is not in the UK, objected to our proposal to impose a charge control on all MCPs (Option A).[186] They were of the view that the higher costs they incurred to provide these international services justify their higher MTRs. Moreover, they argued that the regulatory intervention proposed in Option A would greatly harm consumers.

[184] [✂]
[185] Page 38 of EE's response to the June 2014 Consultation.
[186] [✂]

5.103 The first of these two smaller MCPs [✂] said it principally agreed with extending the charge control to all MCPs found to have SMP. It noted however that this should not include MCPs who are offering a different service to the four largest MCPs. This MCP characterised its service as "international dial through", which it said is different from traditional mobile services because the MCP does not have its own mobile subscribers.

5.104 The second smaller MCP [✂] argued that it is providing a new type of mobile service which is exclusively for foreigners who are temporarily domiciled in the UK. Since most calls to these numbers originate from abroad, the MCP argued that the cost for terminating these calls is higher. It said that *"[…] the cost model of the [✂] mobile service is totally dislocated from the LRIC-based MTR cost models used by Ofcom to determine the MTR benchmarks, which are based on UK mobile networks providing pre and post pay services within the UK only."*

Ofcom's conclusion on charge controlling the four largest MCPs

5.105 We do not consider that the three remedies we have decided to impose would be sufficient cumulatively to constrain the MTRs of the four largest MCPs. In other words, we consider that, in the absence of an MTR charge control, the four largest MCPs would have the incentive and the ability to charge excessive MTRs – even if they were subject to the other three remedies discussed in this section.

5.106 As in 2011, we consider that setting an MTR cap which reflects the costs of an average efficient mobile operator is the appropriate approach to setting the charge control needed to prevent excessive MTRs. The economic analysis of the appropriate cost standard for the MTR cap and the design of an appropriate charge control are the subject of the following three sections of this statement. The analysis and reasoning are therefore not duplicated below but form part of our overall assessment on the appropriateness of a charge control remedy. In particular, the assessment of the charge control condition, in the light of the legal tests for remedies, is presented at the end of Section 8 rather than here.

Ofcom's assessment on charge controlling smaller MCPs

Background

5.107 In the June 2014 Consultation, we considered whether the network access condition requiring smaller MCPs to charge fair and reasonable MTRs (accompanied by our 2011 F&R Guidance) was effective. We said that, when imposing this condition, our expectation had been that the vast majority of MCPs would charge MTRs no higher than the benchmark MTR (i.e. the regulated MTR under the charge control applying to the four largest MCPs). But evidence gathered by us throughout this market review shows that many smaller MCPs have been charging MTRs that are above – in a number of cases, far above – the benchmark MTR.

5.108 As we said in our June 2014 Consultation, Ofcom opened an own-initiative enforcement programme in October 2013 to determine if those MCPs who were notified as having SMP in 2011 were acting in accordance with our 2011 F&R Guidance.[187] The evidence gathered for the enforcement programme suggested that

[187] Further details at http://stakeholders.ofcom.org.uk/enforcement/competition-bulletins/open-cases/all-open-cases/cw_01115/

about half of the smaller MCPs who were designated in 2011 as having SMP had been charging above the benchmark MTR, with about 30% charging 10ppm or more.[188]

5.109 Prior to the June 2014 Consultation, we gathered evidence in relation to the MCPs who began offering MCT after the MCT 2011 Statement. This evidence suggested that a significant number of them charged above the benchmark MTR (with about half of those charging 10ppm or more – see Section 4 for more details).

5.110 We have gathered updated information from smaller MCPs following the publication of the June 2014 Consultation to see if any change has occurred in the period between the June 2014 Consultation and this statement.[189] Based on that information we estimate that smaller MCPs account for about 2.2% of the total voice MCT minutes in 2013/14 and smaller MCPs' total MCT revenues accounted for 3.6% of total MCT revenues. Smaller MCPs who charge above the benchmark MTR for at least one of their mobile number ranges may represent about 1.8% of total MCT revenues, or about £9.0m in 2013/14.[190]

5.111 Our findings above suggest that the fair and reasonable condition and the 2011 F&R Guidance have not resulted in all MCPs designated with SMP in March 2011 charging MTRs at the level of the benchmark rate, which was our intention in the absence of evidence to justify different rates in individual cases. Similarly, they have not been effective in encouraging new entrant MCPs providing MCT after March 2011 to charge MTRs at the benchmark.

Consumer harm from charging above efficiently incurred costs

5.112 In a number of cases in the recent past, smaller MCPs have charged higher MTRs than the four largest MCPs and originating CPs have typically responded by (i) excluding calls which incur higher MTRs from call bundles and (ii) charging consumers higher retail prices. Originating CPs' prices for calls to numbers operated by such smaller MCPs have varied, but have typically been higher than the prices for other calls by a margin greater than the additional cost of above-benchmark MTRs. This means that the consumer impact could be several times more than the cumulative revenue earned from higher MTRs. This may lead to consumer harm, in particular:

- **Bill shock:** Consumers may be unaware of the higher prices of calling such excluded numbers, or indeed that these numbers are excluded from their call allowance. Recent Ofcom research found that 5% of mobile monthly contract consumers experienced bill shock in the 12 month period between May 2013 - April 2014. Calls to non-geographic numbers and calls to numbers not included in their allowances were two of the most commonly cited reasons for bill shock among mobile consumers. [191]

[188] [✂]
[189] See Annex 14.
[190] This £9.0m includes both benchmark and above benchmark MCT revenues for these MCPs.
[191] In 2014, 15% of the 5% of mobile customers who said they experienced an unexpectedly high mobile bill said this was due to calls to non-geographic numbers, and 13% said this was due to making calls to numbers not included in their call allowances – such as those to landline and/or mobile numbers. It should be noted that there may be overlap between these two stated reasons. See slide 14 of Ofcom, *Incidence of unexpectedly high bills*, *2014 report*, face to face survey (conducted

- **Reduced calls to these numbers:** In some cases consumers are aware of the higher prices of calling such numbers – perhaps because they receive a pre-call announcement to that effect on dialling such a number or due to a past experience of bill shock caused by calling an excluded number. However, this may then lead to consumers being deterred from calling these numbers or rationing their calls to such numbers, leading to economic inefficiency (similar to that described in paragraphs 5.27 - 5.28).[192]

- **Uneven playing field:** Finally, smaller MCPs charging such higher prices may use this revenue to fund their retail business, giving them an unfair advantage over other MCPs, thus distorting competition.

Flexibility to reflect efficiently incurred costs of asset-light MCPs below the benchmark rate

5.113 Asset-light MCPs are providers of MCT that do not operate the full technological infrastructure employed by traditional MCPs, such as the four largest MCPs.[193] In relation to those asset-light MCPs, in our 2011 F&R Guidance we said we would take the cap applied to fixed call termination (the "benchmark FTR") as an appropriate starting point for establishing F&R MTRs because we considered that their costs were likely to be more comparable to the costs of terminating a fixed call.

5.114 As already noted, stakeholders raised concerns about Ofcom's flexibility to reflect efficiently incurred costs of asset-light MCPs. In particular, Telefonica suggested that the reference to "*charges*" (and the corresponding 2011 F&R Guidance) in the network access obligation should be kept; and Vodafone commented that flexibility needs to be preserved.

5.115 We recognise that under Option A we would not require smaller MCPs to reduce their MTRs below the charge control cap. Allowing MTRs above cost can potentially result in economic inefficiency, in particular, allocative inefficiency and can distort competition. However, we remain of the view that Option A represents the most appropriate solution in the round for regulating smaller MCPs and we set out our reasons below.

5.116 As noted in the June 2014 Consultation, we consider the scale of the economic inefficiency resulting from asset-light MCPs being allowed to charge above their efficiently incurred costs, to be limited, particularly compared to the consumer harm resulting from the levels and the number of cases of excessive MTRs we have observed since the MCT 2011 Statement. We would expect the F&R MTR of asset-light MCPs to fall somewhere between the 2015/16 benchmark MTR and the benchmark FTR (0.032ppm in 2015/16 in 2012/13 prices)[194], which would suggest a

---

as part of Ofcom's Consumer Concerns Tracker) available at http://stakeholders.ofcom.org.uk/binaries/research/telecoms-research/bill-shock/1398439/Bill_shock_chart_pack.pdf

[192] A clear example of the harm which can be caused by confusion about prices is provided in Ofcom, *Simplifying non-geographic numbers: Final statement on the unbundled tariff and making the 080 and 116 ranges free-to-caller, statement*, 12 December 2013, available at http://stakeholders.ofcom.org.uk/binaries/consultations/simplifying-non-geo-no/statement/final-statement.pdf. This sets out evidence of how consumers are deterred from using particular number ranges such as 0845 and 0870 due to lack of certainty over pricing.

[193] In our 2011 F&R Guidance we referred to these smaller MCPs as "100% OTT MCPs".

[194] Table 1.1, page 4 of the 2013 FNMR Statement.

maximum possible reduction in the MTR of around 0.6ppm. By contrast, as noted in Section 4, at present a significant proportion of MCPs charge above the benchmark MTR, with some charging 10ppm or more.

5.117 We also consider that preserving the reference to "*charges*" (and the corresponding 2011 F&R Guidance) within the clause referring to fair and reasonable terms and conditions could create regulatory uncertainty in a situation where a charge control also applies to all MCPs found to have SMP. For example, it could be unclear whether a smaller MCP charging no more than the charge control cap might be required to lower its MTRs as an outcome of a dispute.

5.118 In addition, the FTR benchmark may not be appropriate in many instances because it would be difficult for us to determine whether or not a particular MCP should be treated as an asset-light MCP and what its efficiently incurred costs are. We discuss this point further in paragraph 5.128 below.

5.119 We consider that these potential negative outcomes outweigh the possible benefits of preserving the reference to *"charges"* (and the corresponding 2011 F&R Guidance).

Flexibility to reflect efficiently incurred costs above the benchmark rate

5.120 Unlike the F&R approach, a charge control would not allow MCPs to charge above the charge control cap. They would therefore not benefit from the flexibility provided by the 2011 F&R Guidance to demonstrate that MTRs above the benchmark are F&R, subject to satisfaction of the criteria set out in the 2011 F&R Guidance.[195]

5.121 Our judgement is that there is not likely to be much, if any, consumer gain from the flexibility to set MTRs above the benchmark MTR as we consider that the number of instances where the criteria set out in our 2011 F&R Guidance would be satisfied is likely to be very low, if not zero.[196] In particular, it seems very likely that the level of efficiently incurred cost is *at most* the level of cost incurred by the four largest MCPs.

5.122 As noted above, in their responses to the June 2014 Consultation, two smaller MCPs [✂] argued that their efficiently incurred costs are higher than those incurred by the four largest MCPs. In particular, the first MCP [✂] argued that the services they offer involve additional costs to be incurred after the initial termination on the UK network (i.e. in order to route the call to a customer outside the UK). The second MCP [✂] argued that the services they offer require additional costs incurred to transit the call internationally before terminating it in the UK and, therefore, its MTR is a function of the International Accounting Rate (IAR) regime. It said that, since its mobile calls

[195] Paragraph A1.22 of the 2011 F&R Guidance.

[196] Prior to our March 2011 Statement, we determined two disputes concerning smaller MCPs' MTRs and in both cases we said that MTRs should be at the benchmark rate. See Ofcom, *Determination to resolve a dispute between Stour Marine Ltd and O2 about termination rates*, final determination, 11 June 2010 (http://stakeholders.ofcom.org.uk/consultations/draft_deter_stour_marine_o2/final_determination/). See also Ofcom, *Determination to resolve a dispute between Mapesbury Communications and T-Mobile about mobile termination rates, final determination and statement*, 20 March 2009 (http://stakeholders.ofcom.org.uk/binaries/consultations/mapesbury_tmobile/statement/mcom_deter.pdf). Since our 2011 F&R Guidance was introduced, Ofcom has not determined any dispute in relation to the MTRs set by smaller MCPs.

"*exclusively originate from overseas*", according to its "Interconnect Contract"[197] with BT, its mobile number ranges are included in Schedule 307[198] of BT's CPL which sets a higher MCT rate for them.

5.123 We recognise that the overall costs of providing international services, such as call forwarding over UK mobile number ranges, might exceed the costs considered in calculating our charge-controlled MTR caps. However, we consider that the costs associated with international conveyance/transit are not relevant to the costs incurred for the provision of mobile call termination within the UK. Therefore, we expect the level of MCT costs efficiently incurred (even by MCPs who use mobile number ranges to provide international services) to be *at most* the level of the charge-controlled MTR cap.

5.124 In addition, we consider that there are other number ranges provided in the National Telephone Numbering Plan that are more suitable for the provision of international services.

Two-cap MTR system

5.125 As noted above, in their response to the June 2014 Consultation, EE proposed a two-cap MTR cap system where all smaller MCPs are regulated at a lower rate to reflect EE's view of their lower cost base and would only be permitted to move to the higher MTR benchmark if they are able to demonstrate to Ofcom higher efficiently incurred costs. We do not think it would be appropriate or proportionate to impose a two-cap MTR cap system and we set out our reasoning below.

5.126 We acknowledge in paragraphs 5.113 - 5.119 that setting a single cap MTR system creates a limited risk of economic inefficiency from allowing some MCPs, in particular asset-light providers, to charge above their efficiently incurred costs. However, we consider it is likely that the extent of this inefficiency would be very small.

5.127 In particular, we have estimated that the total off-net traffic volume terminated by asset-light providers is in the range of 80-90 million minutes a year (below 0.2% of total MCT traffic), generating a maximum yearly overpayment[199] of £500k - £600k under a single MTR cap approach. On this basis, we think that EE's calculation of the £4.46m overpayment is a significant overstatement. It appears that this is because EE has incorrectly assumed that all smaller MCPs are asset-light providers and that all smaller MCPs have efficiently incurred costs near the FTR.

5.128 In addition, given the diversity of technological approaches used by different smaller MCPs, it would be difficult for us to determine what the termination costs of a hypothetical efficient smaller MCP would be[200] and also whether or not a particular

[197] Interconnect Contract is a term used by BT. It refers to a contract between BT and a MCP that allows the latter to connect their network to BT and calls to pass between the two networks.
[198] Schedule 307 of BT's "Interconnect Contract" applies to the provision of international in-bound calls which originate from authorised overseas systems, interconnected via BT and terminated at a contracting MCP. BT schedules are available at https://www.btwholesale.com/pages/static/Library/Pricing_and_Contractual_Information/Telephony_Reference_Offer/index.htm
[199] Where in this case the overpayment is the difference between the MTR and the FTR which in 2015/16 is 0.032ppm.
[200] EE suggested that the MTR cap for smaller MCPs should be set close to the FTR cap but provided no further analysis (see page 39 of EE's response to the June 2014 Consultation).

MCP should be treated as an asset-light MCP. First, smaller MCPs operate a variety of different business models, using different network technologies and structures, which will result in a variety of costs. For example, MCPs can use VoIP applications over WiFi, VoIP applications over a data connection of another MCP or they can forward their inbound calls to customers' other numbers, thus terminating calls over a fixed network. In addition, the business model and/or network technology used may be mixed and may also change over time. An MCP which could initially be considered an asset-light provider may start offering mobile voice calls by more traditional means, e.g. by means of an MVNO contract or by deploying its own radio access network. In any case, calls to mobile numbers allocated to asset-light MCPs represent a very small proportion of total mobile calls.[201] For this market review period, we consider it would be unduly resource-intensive and disproportionate to the likely benefits for consumers to examine the efficient costs of all asset-light MCPs.

5.129 We disagree with EE's assumptions about the total administrative cost of a two-cap MTR system. Taking into account the market share of asset-light MCPs and the potential harm that arises from a single MTR cap, we consider that the total administrative costs for industry and Ofcom of a two-cap MTR system are likely to exceed any losses from distorted competition or lost consumer surplus under a single MTR cap system.

5.130 We also do not agree with EE that MCPs should be required to provide documentation to Ofcom before being entitled to the maximum MTR. In these particular circumstances, we consider it would be disproportionate to require all smaller MCPs to provide evidence about their costs in order for them to be allowed to charge up to the charge control cap applying to the four largest MCPs.

Other considerations in charge controlling smaller MCPs

5.131 In reaching our decision on charge controlling smaller MCPs we have had regard to a number of additional considerations, namely: 1) regulatory certainty and deterrent effect; 2) compliance costs and ease of enforcement; and 3) incentives for originating MCPs. We discuss these in turn below.

5.132 First, a charge control presents both buyers and providers of MCT with greater clarity and regulatory certainty about permissible MTRs than an obligation to charge fair and reasonable MTRs (supplemented with guidance) in that there would be no flexibility to charge above the cap. We consider that this greater clarity would mean that imposing a charge control on all MCPs found to have SMP is likely to have a greater deterrent effect against charging MTRs above the cap set by Ofcom and thus, all else being equal, bring about greater compliance.

5.133 Second, in the event of apparent non-compliance, enforcement action by us would be needed under either option. However, it is comparatively easier and swifter for us to enforce compliance with a specific charge cap, such as one set by a charge control, than with a concept such as F&R. We consider that this also aids regulatory certainty for CPs.

5.134 We recognise that a charge control is more intrusive than the F&R approach. However, in terms of compliance costs, a simple charge control of the type we

[201] Smaller MCPs account for 2.2% of the total MCT volume; the MCT traffic generated by asset-light MCPs would be lower than that.

envisage (i.e. a charge control that sets a flat rate cap but does not impose additional obligations such as periodic compliance calculation and reporting) would not necessarily be more burdensome to comply with. In some circumstances a charge control of this type may be even less burdensome.

5.135 Third, we consider that setting a charge control on the termination charges of all MCPs found to have SMP would also encourage originating CPs to include calls to smaller MCPs in their call allowances/bundles, which is likely to be beneficial to consumers.

Overall conclusion for smaller MCPs

5.136 We recognise that there are advantages and disadvantages from adopting different approaches to regulating MTRs of smaller MCPs, as discussed above. However, on balance, on the basis of the evidence and the reasoning presented above, we believe that setting a single MTR cap on all MCPs who have SMP is an appropriate remedy.

5.137 We note also that our decision to impose a charge control on all MCPs with SMP is consistent with the EC's preference for mandated symmetric reciprocal termination rates.[202]

Alternative forms of MTR regulation

5.138 In the previous MCT market review, we also considered alternatives to a "traditional" charge control, including de-regulation (i.e. whether regulation of MTRs was necessary at all), capacity-based charges (CBC), mandated fixed-mobile termination rate reciprocity and mandated "bill and keep" (B&K).[203] We explained why we did not consider these to be appropriate.[204]

5.139 Specifically, with respect to CBC – an approach under which MTRs would be charged for based on a measure of the capacity required for terminating traffic – we said that this approach to a charge control would be difficult to implement and complex and contentious for CPs. For example, it would be difficult to choose an industry-wide capacity measure (in particular, whether the capacity increments were likely to favour larger CPs over smaller CPs). Also, the adoption of a CBC approach would not remove the need for MTRs to be set at some measure of cost. Therefore, we concluded that the difficulties associated with this approach were likely to outweigh the benefits.[205]

5.140 With respect to mandated FTR-MTR reciprocity – an approach under which termination rates would be set at the same rate for all terminating traffic (whether fixed or mobile) – we noted that a single termination rate for both fixed- and mobile-terminated calls would provide industry with a simple and clear regulatory regime, leading to a decrease in the regulatory burden. But we also said that identifying a single 'efficient' benchmark would be very challenging. We noted that a significant problem with this approach was that the underlying costs of fixed and mobile

[202] See, for example, the Explanatory Note to the 2009 EC Recommendation, in particular section 3.
[203] Section 6 of Ofcom, *Wholesale mobile voice call termination, Preliminary consultation on future* regulation, consultation, 20 May 2009.
http://stakeholders.ofcom.org.uk/binaries/consultations/mobilecallterm/summary/mobile_call_term.pdf
[204] Section 7 of the April 2010 Consultation.
[205] Paragraphs 7.19-7.26 of the April 2010 Consultation.

termination remained different. Therefore, mandating reciprocal termination rates (at the FTR level) would be likely to result in MTRs below cost.[206]

5.141 With respect to mandated B&K – an approach which would effectively set termination rates to zero between all MCPs, we noted that such a regime would offer simplicity and transparency. In its response to our October 2013 stakeholder workshop, H3G noted that, while it supported the use of LRIC for the 2015/18 MTR charge control, it may be appropriate for Ofcom to consider if alternative approaches, namely B&K and Called Party Pays, might be appropriate for the future regulation of MTRs.[207] In its submission to Ofcom, BT also noted potential benefits from B&K, citing BEREC's June 2010 report "Next Generation Networks Future Charging mechanisms / Long-term termination issues" and BEREC's 2012 report "An assessment of IP interconnection in the context of Net Neutrality".[208]

5.142 However, mandated B&K is unlikely to set prices at an efficient level, unless there are material un-internalised call externalities. As noted in the April 2010 Consultation, we are not aware of any empirical work assessing the scale of call externalities and the degree of possible internalisation, although some of the recent literature has continued to highlight the importance of call externalities in the efficient pricing of termination.[209] Without sound evidence on the strength of un-internalised call externalities, or evidence of material transactions costs, to set against the incremental costs of termination, it is difficult to make a compelling case for mandated B&K.[210]

5.143 For the same reasons set out above, we remain of the view, as set out in the MCT 2011 Statement, that adopting an alternative form of charge control, including mandated B&K would not be appropriate for MTR regulation for the time being.

5.144 In the next section we therefore restrict our assessment to costs standards for a charge control which takes the traditional form of a cost-based cap on MTRs.

Legal tests

5.145 The satisfaction of the legal tests by the charge control condition is discussed in Section 8 in paragraphs 8.107 - 8.118 after we have presented the design of our charge control condition. (The charge control condition is set out in Part 3 of Schedule 2 in Annex 3 (Condition M3)).

Price transparency obligation

5.146 In the absence of reasonable clarity and certainty with respect to MTRs the purchasers of MCT (such as originating CPs and transit providers) would not have

---

[206] Paragraphs 7.33-7.39 of the April 2010 Consultation.
[207] See page 7 of H3G's response to the October 2013 stakeholder workshop, available at http://stakeholders.ofcom.org.uk/telecoms/policy/mobile-policy/mobile-call-termination-review-2015-2018/responses/
[208] See pages 6-7 of BT's response to the October 2013 stakeholder workshop, available at http://stakeholders.ofcom.org.uk/telecoms/policy/mobile-policy/mobile-call-termination-review-2015-2018/responses/
[209] Harbord, D. and Hoernig, S., *Welfare Analysis of Regulating Mobile Termination Rates in the UK*, May 2014, Journal of Industrial Economics and Hoernig, S., *Competition between multiple asymmetric networks: Theory and applications*, 2014, International Journal of Industrial Organization.
[210] Paragraphs 7.40-7.57 of the April 2010 Consultation.

forward-looking certainty concerning the costs of purchasing MCT. This would harm competition and, at the retail level, consumers' interests.

5.147 Also, if MCPs were not to publish their MTRs or not notify changes in their MTRs then there would be a decrease in industry-wide transparency with respect to MTRs. This development would impair the ability of both Ofcom and CPs to monitor the compliance of dominant providers with SMP conditions related to MTRs.

5.148 For the above reasons, in our June 2014 Consultation we considered it appropriate to impose a price transparency obligation on all MCPs with SMP.

Stakeholders' responses to consultation

5.149 Most stakeholders agreed with our proposal to impose a price transparency obligation on all MCPs with SMP. BT said that it does not consider that there are any significant costs in complying with this obligation and that the transparency it provides is useful.

5.150 Telefonica, however, argued that the inclusion of a price transparency obligation is "*otiose*" and will not be "*objectively justified, targeted and proportionate*".[211] This is because, if all MCPs with SMP are subject to a charge control and Ofcom publishes the regulated cap in advance, then MCPs must charge no more than the permitted rate.

Ofcom's conclusion

5.151 Following our MCT 2011 Statement, all MCPs designated with SMP have been required to publish their MTRs (M4.1, M4.2) and to publish changes to their MTRs at least 28 days in advance of those changes coming into effect (M4.3). We also said that such publication would be required to be effected by (i) sending MTR information to any person who may reasonably request it and (ii) by placing "such information on any relevant website operated or controlled by the dominant provider" (M4.4). We set out the minimum information that any such notification of a change in MTRs must include (M4.5).

5.152 We do not agree with Telefonica that a price transparency obligation is redundant if there is a charge control on all MCPs with SMP and Ofcom publishes the regulated cap in advance. We consider that price transparency would still be important under such circumstances.

5.153 In particular we consider that the price transparency obligation has the purpose of ensuring advance warning is given of charge changes to providers who purchase MCT services and ensures that they have sufficient time to plan for such changes. In the absence of reasonable clarity and certainty with respect to MTRs the purchasers of MCT (such as originating MCP and transit providers) would not have forward-looking certainty concerning the costs of purchasing MCT. This would harm competition and consumers' interests at the retail level.

5.154 We also consider that imposing a requirement to publish MTRs and to notify changes in MTRs would facilitate easier monitoring of compliance, which would lead to greater certainty in the MCT market. We consider this goal desirable, especially since this is

[211] See response to question 5.4 on page 4 of Telefonica's response to the June 2014 Consultation.

the first time the charge control obligation has been extended to all MCPs with SMP. Increased transparency of MTRs would also assist with enforcement – if such intervention by Ofcom were required.

5.155 The cost of complying with a price transparency obligation is relatively low. All MCPs found to have SMP have been required to publish MTRs and to notify changes in their MTRs since March 2011; the four largest MCPs have had such an obligation for many years.

5.156 We do not assume, as Telefonica suggests, that all smaller MCPs will be pricing MCT at the maximum MTR permitted by the charge control. For example, some smaller MCPs may decide to charge less than the MTR cap for terminating calls to their mobile number ranges.

5.157 We therefore conclude that it is appropriate to retain the SMP condition that requires all MCPs with SMP to publish their MTRs and to notify changes in their MTRs.

5.158 Part 3 of Schedule 2 in Annex 3 sets out the price transparency obligation (Condition M4).

Legal tests

5.159 Section 87(6)(b) of the Act authorises the setting of SMP conditions which require a dominant provider to publish, in such manner as Ofcom may from time to time direct, all such information as Ofcom may direct for the purpose of securing transparency.

5.160 We consider that this condition meets the criteria set out in section 47(2) of the Act because it is:

i) objectively justifiable, in that it ensures that MTRs are published, and this will increase transparency to stakeholders and facilitate the monitoring of compliance with relevant SMP conditions;

ii) not unduly discriminatory, in that it applies equally to all designated MCPs;

iii) proportionate, in that it is the least onerous obligation to address the concerns described above and to facilitate compliance with regulatory obligations without raising issues of commercial confidentiality; and

iv) transparent, in that the condition is transparent in its operation and has been accompanied (in this document) by an explanation of its intended operation and effect.

5.161 We have considered our duties under section 3 of the Act. We consider that this condition furthers the interests of consumers in relevant markets by the promotion of competition because it provides price certainty to CPs and facilitates compliance monitoring. It thus complements the other SMP conditions, such as the obligation to provide network access on fair and reasonable terms and the charge control. Therefore, we consider that the transparency obligation ultimately promotes competition and benefits consumers.

5.162 We consider that this condition meets the Community requirements set out in section 4 of the Act (in particular the requirements to promote competition in the provision of electronic communications services and electronic communications services, and to

encourage network access for the purpose of securing efficient and sustainable competition and the maximum benefit for customers of CPs).

Implementation of remedies

5.163 The new SMP conditions will apply from 1 April 2015, except for the charge control condition on smaller MCPs, which will apply from 1 May 2015 (in consideration of the fact that they are not currently subject to a charge control).

5.164 In relation to the charge control condition for the four largest MCPs, we have decided to allow a transition period until 1 May 2015 during which we require the four largest MCPs to charge no more than the cap set for the period 1 April 2014 to 31 March 2015, i.e. 0.845ppm.

5.165 From 1 May 2015, the new charge control cap as set out in Table 8 shall apply to all MCPs designated as having SMP, including all smaller MCPs.

5.166 Between 1 April 2015 and 1 May 2015, we would expect smaller MCPs to charge no more than the cap imposed on the four largest MCPs (i.e. 0.845ppm). We consider that symmetrical MTRs set at this level are likely to be fair and reasonable and this would be likely to be our starting point in resolving a dispute under section 185 of the Act that was brought to us in relation to charges in this period.

5.167 For clarity, the 2011 F&R Guidance will cease to apply from 1 April 2015. However, we may still have regard to such Guidance, where appropriate, in resolving disputes concerning the MTRs charged by smaller MCPs prior to that date.

New entrants

5.168 An MCP that begins providing MCT after this statement is published would not be subject to the SMP conditions above. However, if an interconnecting CP were unable to agree terms of access with such an MCP, either party could refer a dispute to Ofcom for resolution under section 185 of the Act. While we would consider each case on its facts, in general we are likely to consider that the regulated cap under the charge control is the appropriate starting point for MTRs charged by new entrant MCPs.

Section 6

Cost standard for the MTR charge control

Summary

6.1 In Section 5, we set out our conclusion that we should regulate MTRs by imposing a charge control obligation on all MCPs designated as having SMP. In this section, together with the relevant annexes, we set out our conclusions on the appropriate cost standard for the MTR charge controls, having taken all representations into account.

6.2 We have considered charge control caps at LRIC and LRIC+ levels. As in previous reviews, we use LRIC to denote our modelled estimate of the pence per minute long run incremental cost of termination, for the average efficient MCP. LRIC+ adds to this a mark-up based on an allocation of common costs (determined by the cost model). We also consider whether some other levels between LRIC and LRIC+ may be appropriate.

6.3 Among respondents to the June 2014 Consultation, H3G, BT, [✂], Verizon and Virgin Media all agreed that LRIC is the appropriate cost standard. EE, Vodafone and Telefonica argued that a charge above LRIC is preferable to charge designed to be at LRIC.

6.4 Having considered stakeholders' comments, we remain of the view that, for the period 2015-2018, LRIC remains the appropriate cost standard for the MTR charge control.

6.5 We believe an MTR cap at LRIC is more likely to encourage effective competition, which - all else equal - will also result in improved economic efficiency. We also consider that regulatory certainty is important, and note that our decision is consistent with the 2009 EC Recommendation, which recommends termination rates be set at LRIC, and with our recent decision to cap FTRs at LRIC (over the period January 2014 to 30 September 2016).

6.6 We do not believe that consideration of other criteria provide any significant counter-arguments for a move to LRIC+, or any other charge control designed to be above LRIC.

6.7 The remainder of this section is structured as follows. We first summarise the regulatory framework and previous regulatory decisions which are relevant to the choice of cost standard. We then introduce our analytical framework and assess the choice of cost standard using that analytical framework. We consider both theoretical arguments and the empirical evidence (although we note that many factors will also have changed over time as well as MTRs, which makes an empirical comparison between outcomes under LRIC+ and LRIC less straightforward). We also address stakeholder comments received in response to the June 2014 Consultation.

Regulatory Framework

6.8 The 2009 EC Recommendation recommends that NRAs adopt a LRIC standard for the regulation of termination rates (as opposed to an approach based on LRIC+). As

set out in Section 2, we are required to take utmost account of this recommendation in carrying out this market review.

6.9 In 2011, after extensive analysis and consultation, we decided to move from a LRIC+ to a LRIC standard in our regulation of MTRs. That decision, which was subsequently upheld on appeal to the CAT, Competition Commission and Court of Appeal, had the effect of lowering, the price ceiling from 4.18ppm (for Vodafone/Telefonica/EE, 4.480 ppm for H3G) in 2010/11 to 0.67ppm in 2014/15, leading therefore to a reduction of over 80% in that period.[212]

6.10 A LRIC standard is also consistent with the approach taken to regulating fixed termination rates (FTRs) in our 2013 FNMR Statement.

6.11 Among the main European NRAs that started reviews of wholesale MCT after the 2009 EC Recommendation was published, almost all have adopted, or will soon adopt, MTRs at LRIC.[213]

Framework for assessment

6.12 In assessing the appropriate cost standard for the MTR charge control, our framework is based on the following four criteria:

- Economic efficiency, including both:
  - Static efficiency – with a focus on allocative efficiency which is concerned with whether the allocation of resources is optimal, taking into account the cost of supplying the service in question as well as demand (i.e. consumer preferences) for these services;
  - Dynamic efficiency – dynamic efficiency is concerned with whether firms have the correct incentives to invest and innovate;
- Competitive effects – the analysis of competitive effects seeks to identify whether one or other cost standard is more likely to encourage effective competition. Increased competition generally promotes both static and dynamic efficiency;
- Distributional effects on “vulnerable” consumers;
- Commercial and regulatory consequences - in particular whether one or other of the cost standards could have unintended commercial and/or regulatory consequences.

[212] The MTRs reported here are in 2008/09 constant prices. The 0.67ppm rate was set by the CC in its 2012 CC Determination (replacing the rate of 0.690ppm initially imposed by Ofcom in the March 2011 Statement). The CC also reduced the length of the glide path imposed by Ofcom in the March 2011 Statement, with LRIC levels to be fully implemented by 1 April 2013 (instead of 1 April 2014 as initially imposed by Ofcom).

[213] The main exceptions are Germany (BNetzA has decided not to implement LRIC) and the Netherlands. (The Dutch trade and industry appeals tribunal annulled on 27 August 2013 the LRIC FTRs and MTRs adopted. The tribunal replaced them with rates based on LRIC+, effective from 1 September 2013.) See Cullen International, *Mobile termination rates - Moving towards pure LRIC?*, 27 February 2014. http://www.cullen-international.com/product/documents/CTTEEU20140049

6.13 These are the same criteria used in the 2011 MCT Statement. This was also the framework that the CC followed in its 2012 CC Determination. No responses to our June 2014 Consultation suggested that we should use an alternative framework.

Economic efficiency: Static efficiency

Summary of proposals in June 2014 Consultation and stakeholders' responses

6.14 Our June 2014 Consultation considered arguments on static efficiency, separately from those relating to competition, while noting that static efficiency will also be affected by changes in the level of competition. We proposed that the theory and empirical evidence was inconclusive as to whether LRIC or LRIC+ is preferable for static efficiency.

6.15 BT said it supported Ofcom's analysis of the theory and evidence relating to allocative efficiency. H3G said that theory strongly suggested LRIC was preferable for allocative efficiency. [✂] agreed with Ofcom's conclusion, although it argued that LRIC is the only approach compatible with the 2009 EC Recommendation and with earlier cases.[214]

6.16 EE, Vodafone and Telefonica all suggested that allocative efficiency considerations point to the use of an MTR above LRIC. They argued that, should LRIC be the chosen cost standard, allocative efficiency considerations should persuade Ofcom to be cautious in its modelling of LRIC, as the harm to allocative efficiency was greater if modelling errors meant that the MTR were below the true level of LRIC than if it were above LRIC.

Components of static efficiency

6.17 Static efficiency encompasses productive and allocative efficiency.

6.18 Productive efficiency requires demand to be served at least cost. This is less of a concern in this case given the nature of mobile services. In particular, assets used to provide termination are also used to provide many other network services including, but not limited to, call origination. Provided that there is effective competition between MCPs at the retail level, this is likely to incentivise MCPs to minimise costs. Furthermore, both LRIC+ and LRIC approaches would involve setting MTRs within a price-cap that delivers incentives for cost minimisation.

6.19 An allocation of goods or services is said to be allocatively efficient if it is such that prices at the margin (i.e. for the last unit(s) consumed) are equal to the marginal (or incremental) cost of producing that additional unit(s). This way, consumers with a willingness to pay at or above marginal cost are not excluded from consuming the goods or services.

[214] See *British Telecommunications plc v Office of Communications (case 1180/3/3/11), Everything Everywhere Limited v Office of Communications (case 1181/3/3/11), Hutchison 3G UK Limited v Office of Communications (case 1182/3/3/11), Vodafone Limited v Office of Communications (case 1183/3/3/11) and Telefónica UK Limited ([2012] CAT 11),* judgment of the CAT of 3 May 2012. http://www.catribunal.org.uk/files/1180-83_MCT_Judgment_030512.pdf

6.20 LRIC is not precisely equivalent to marginal cost (unless the increment is the last chargeable unit consumed). But it is a more appropriate basis for regulatory price setting than marginal cost which is likely to be extremely hard to measure.

6.21 However, in practice many firms incur costs that are common across customers and services. In the presence of common costs, it is not possible for an MCP to price all services at LRIC because it would not recover its common costs, and it must set some prices, at least, above LRIC.

6.22 In situations where common costs have to be recovered, one approach to minimising distortions (relative to pricing at incremental cost) is to price according to the Ramsey pricing principle. Under Ramsey pricing, a multi-product firm would be required (by regulation) to set mark-ups over incremental cost for each service based on the responsiveness of demand to prices. In particular, the mark-up over incremental cost is set in such a way that (a) the most price sensitive consumers (measured by the elasticity of demand) should face the smallest percentage mark-up and the least price sensitive consumers should face the largest percentage mark-up;[215] and (b) the firm just breaks-even (i.e. recovers total costs, including its cost of capital, across all services and volumes).

6.23 An alternative approach to common cost recovery, and one more frequently encountered in the literature on termination markets, is to recover fixed and common costs through fixed fees. Where such fixed fees are set such that no consumers are inefficiently priced out of the market (i.e. would give up their subscription even though the value of them being on the network exceeds the marginal cost of maintaining their connection), then it will typically be more efficient to recover fixed and common costs from fixed (i.e. subscription) fees than from usage fees.

Allocative efficiency and Ofcom's choice of cost standard

6.24 Abstracting from the recovery of common costs and externalities, MTRs at LRIC would be optimal for allocative efficiency, because they would encourage retail pricing which is close to marginal cost for fixed to mobile and off-net mobile to mobile (M2M) calls. Once the recovery of common costs and other effects are taken into account, the optimal MTR is not clear – within the academic literature it depends on many assumptions.

6.25 Under certain restrictive assumptions, there could be a theoretically optimal MTR that is above LRIC. This is because Ramsey pricing principles indicate that it may be optimal for all consumer groups to contribute something to common costs, and having MTRs above LRIC would mean that fixed and international callers contribute to the common costs of mobile networks, whereas those callers would not contribute towards the common costs of MCPs if MTRs were at LRIC.

[215] Elasticity of demand measures the percentage change in quantity demanded relative to the percentage price change. A service has an elastic demand when a given change in price has a more than proportionate effect on the demand of that good (e.g. if prices change 10%, demand changes by more than 10%). A service has inelastic demand when a given change in price produces a less than proportionate change in demand (e.g. if prices change 10%, demand changes by less than 10%). The Ramsey pricing rule is based on an inverse price elasticity rule whereby the least elastic service attracts the largest percentage margin over marginal cost and the most elastic service attracts the smallest percentage margin over marginal cost.

6.26 However, calculating the amount that they should contribute is very complicated. It requires detailed knowledge of the elasticity of demand for each service as well as how the price in one market affects demand in others (i.e. the cross-elasticities of demand) and there are significant practical challenges to gathering reliable information on all relevant elasticities. For this reason, Ramsey pricing is rarely, if ever, applied in practice. Instead, mark-ups over incremental cost have typically followed either the cost allocation rules implied by regulatory cost models (e.g. routing factors) or a simple rule such as an equi-proportional mark-up for each service over incremental cost.

6.27 EE, Vodafone, and Telefonica responded that while the Ramsey price may be difficult to calculate, it is certainly above LRIC so long as demand for MCT is not perfectly elastic. They argued that this means that allocative efficiency is more likely to be maximised by at least some mark-up over LRIC. They therefore argued that we should use a cost standard with some mark up over LRIC, even if not LRIC+, rather than using the LRIC standard which they believed was clearly too low.

6.28 EE argued that LRIC is the very bottom of what they consider to be the range of possible optimal MTRs, and so if MTRs were above LRIC, this would lead to charges closer to allocatively efficient levels. It noted that while non-linear pricing will tend to reduce the optimal MTR towards LRIC, we had presented no analysis to assess where the efficient level is within the range between LRIC and LRIC+. EE suggested that the empirical evidence of fixed to mobile pass through increases the likelihood that an MTR above LRIC would best promote overall consumer benefits. It believed the optimal MTR could even be significantly in excess of LRIC+. It referred to a recent academic paper by Jullien, Rey and Sand-Zantman, which suggested that with elastic demand for subscription the welfare maximising termination charge is above LRIC in their model.[216] EE also noted that when Oftel commissioned research in 2002 to estimate the efficient level of MTRs, it found that MTRs should be set with a significant mark-up over LRIC.[217] It argued that we had not presented any analysis to demonstrate that Oftel's analysis no longer reflects current market circumstances.

6.29 In a simplified Ramsey pricing framework (e.g. linear pricing of all retail services) where firms are just breaking even, it may theoretically be efficient for calls to mobiles to be priced with a mark-up above LRIC. However, translating this into the efficient wholesale charge (i.e. MTR) is not straightforward, not least since retail prices are not regulated and there are complex interactions between MTRs and the retail prices set by competing CPs.

6.30 Moreover, even if the optimal MTR were above LRIC, it is very difficult to collect the necessary evidence to know how far above LRIC it is, even within the context of a stylised model. For example, alongside the overall conclusions of the Jullien, Rey and Sand-Zantmann paper cited by EE, we note that the implied optimal mark-up over LRIC varies depending on a range of highly uncertain parameters.[218] A key conclusion of the paper (in keeping with much of the literature in this area) is that the

---

[216] Jullien, B., Rey, P. and Sand-Zantman, W., 2013, 'Termination fees revisited', International Journal of Industrial Organization, vol. 31(6), ('Jullien et al.') pages 738-750.
[217] Jeffrey Rohfls, A model of prices and costs of mobile network operators, May 2002. Available at: http://www.ofcom.org.uk/static/archive/oftel/publications/mobile/ctm_2002/main_report.pdf
[218] For example, the authors suggest that the optimal mark-up is lower, the greater the extent of competition, the less likely that low use customers are to give up their mobile phone in response to price rises, the more that customers value receiving calls, and the more likely that high use customers are to reduce their call volumes in response to price rises.

optimal mark-up tends to zero as it becomes more unlikely that low use customers will give up their mobile phones in response to price rises (i.e. the more inelastic is subscription demand). Given that mobile use is nearing 100 per cent of adults,[219] and has been rising at the same time as MTRs have been falling, we consider that the elasticity of subscription is now likely to be very low – which would imply a very low or near zero optimal mark-up. That any mark-up is optimal within the framework of the paper, even with elastic demand for subscription, also relies on marginal consumers being subject to subscription fees (rather than just usage fees), and that there are benefits to others from the presence of these marginal consumers being in the market. We note that there are pre-pay packages that do not include subscription fees (or large minimum top-ups), and that because mobile ownership is now so widespread and the retail price of obtaining a basic mobile connection is now very low (see for example the handset price evidence presented below), it seems most unlikely that there are subscribers with demand for mobile telephony that are being inefficiently priced out of participating in the market.

6.31 The Oftel-commissioned research, which EE highlighted,[220] also showed that the optimal mark-up is uncertain. The applicability of the Oftel research is uncertain given the major changes that have occurred within the mobile market in the time since its publication in 2002.[221] But we note that even within the market context in 2002, further Oftel-commissioned research illustrated that with retail price discrimination the optimal mark-up over LRIC was close to zero.[222]

6.32 There are a number of counteracting factors which indicate that the optimal level (taking allocative efficiency in isolation) may be at, close to, or potentially even below LRIC.

6.33 First, there is a high degree of retail price discrimination in the retail mobile market. The greater the extent of retail price discrimination, the more easily MCPs can recover common costs from retail prices while minimising distortions in take-up and usage, and therefore the lower the economically efficient mark-up over LRIC. MCPs price discriminate extensively, as shown by the range of retail tariffs in existence, including menus of non-linear tariffs that have multiple combinations of subscription and usage charges. This will tend to reduce the optimal mark-up over LRIC for MCT. Telefonica stated that MCPs may not be able to recover all their common costs through price discrimination. However, we believe that the high degree of existing price discrimination observed suggests that, all else equal, considerably less than the

---

[219] At Q1 2014, 93% of adults personally owned/used a mobile phone in the UK (Ofcom, *see* http://media.ofcom.org.uk/facts/); at Q2 2014 95% of households used mobile telephony (Ofcom, *Communications Market Review,* Figure 5.55).

[220] Jeffrey Rohfls, *A model of prices and costs of mobile network operators*, May 2002. Available at: http://www.ofcom.org.uk/static/archive/oftel/publications/mobile/ctm_2002/main_report.pdf

[221] For example, the work assumed a world in which mobile penetration was much lower and MCPs were assumed to use MTR mark-ups to efficiently attract marginal subscribers (for example through handset subsidies). Today we have near full penetration, and in any case (as the CC found in its 2012 determination – see paragraph 2.823) the loss of subscriptions that are being subsidized is not necessarily allocatively inefficient, while the loss of 'efficient' users has to be set against the detrimental effects of higher MTRs. One notable detrimental effect explained later in this section is the distortion of competition between CPs.

[222] Rohlfs, J.H., *Response to Competition Commission, Estimates of Targeted Subsidies*, 2002, http://www.ofcom.org.uk/static/archive/oftel/publications/mobile/ctm_2002/rohlfs0602.pdf. Table 1 of that report shows how in the base case model the mark-up for fixed to mobile calls is 0.77ppm and falls to 0.06ppm with a two-part tariff and falls to 0.05ppm with a three-part tariff.

linear Ramsey mark-up for common cost should be recovered from calls to mobiles via MTRs.

6.34 Second, we are not setting different MTRs for calls from MCPs, fixed call providers (FCPs) or International CPs (i.e. from callers outside the UK). Because of this, MTRs above LRIC would not only lead to some cost recovery from the fixed and international segment, but they would also affect calls from one MCP to another (without leading to any net cost-recovery for the mobile industry). MTRs above LRIC have the effect of distorting MCPs' perception of incremental costs.[223] Where we take calls to be the relevant pricing unit, there is a distortion of the perceived incremental cost of off-net calls.[224] Where we take customers to be the relevant pricing unit, there is a distortion to the perceived incremental cost of serving customers whose outgoing and incoming MTR-affected calls do not balance. This in turn gives providers incentives to set prices which are further from true incremental costs than is necessary for the efficient recovery of common costs, and these pricing effects will tend to distort customer demand and reduce allocative efficiency.

6.35 In line with the 2012 CC Determination,[225] we consider that this distortion of customer demand caused by MTRs above LRIC may be harmful for efficiency whether it results, for a particular consumer, from price reductions relative to the efficient level (as would be expected for net receivers of MTR affected calls) or from price increases relative to the efficient level (as would be expected for net makers of MTR affected calls). This pattern of price changes, which appears to have held in practice, is discussed in more detail in Annex 5.

6.36 Similarly, H3G argued that MTRs at LRIC are preferable to MTRs above LRIC because MTRs above LRIC lead to double marginalisation, where MCPs will tend in their retail pricing to apply a margin on top of the margin already inherent within a LRIC+ MTR. It said that the result of this is that the marginal retail price of off-net calls is distorted above the Ramsey price of off-net calls.

6.37 Because the number of M2M calls, and in particular the number of M2M off-net calls, is larger than the number of calls to mobiles from other networks, and becoming relatively larger over time, we consider that these distortionary effects on the mobile sector are becoming more important relative to the potential benefits of recovering some common costs from fixed or international callers. [226]

---

[223] Throughout, we refer to 'perceived' incremental costs to distinguish the costs of off-net termination as faced by MCPs when they pay MTRs to other operators, from the 'true' incremental cost of termination which is the cost incurred by the operator actually carrying out the termination (that is, LRIC).

[224] This refers to situations where an operator is deciding the price of off-net calls, or the price differential between bundles that include varying numbers of off-net calls. Even for a customer whose starting balance of MTR affected calls is even, MTRs above LRIC distort MCPs' retail pricing incentives to encourage that customer to make additional calls, since these additional outbound calls may not necessarily be accompanied by equal numbers of inbound MTR affected calls.

[225] See paragraphs 2.799-2.812 of the 2012 CC Determination.

[226] In 2013/14 there were around 60 billion minutes of gross termination traffic, of which around 43 billion were mobile off-net originated and around 17 billion minutes were non-mobile originated (e.g. originated from fixed or international networks and terminated on UK mobile networks). The gross termination traffic grew by 5 billion minutes between 2009/10 and 2013/14 (from around 55 billion in 2009/10), with growth of around 6 billion minutes for M2M off-net calls (from 37 billion minutes in 2009/10), while the volume of termination from fixed and international calls fell by around 1 billion minutes (from around 18 billion minutes in 2009). In other words, the ratio of M2M off-net calls to

6.38 Third, call externalities may also be relevant. It is likely that when a consumer makes a call, it benefits the receiver as well as the caller. These are referred to as positive call externalities. The presence of such call externalities could mean it is beneficial for a call to be made even when the benefit of that call to the caller is below incremental cost. To the extent that such externalities are not already internalised by MCPs, this reasoning could reduce the optimal MTR, including potentially below LRIC. We have previously explained that it is difficult to reflect un-internalised positive call externalities through a mark-down of MTRs, since robust empirical evidence is lacking,[227] and as far as we are aware this remains the case although some of the recent literature has continued to highlight the importance of call externalities in the efficient pricing of termination.[228]

6.39 A fourth point to make in the context of allocative efficiency is the linkage with competition effects. As explained later, competition is enhanced with MTRs at LRIC. Increasing competition is likely to lead to more allocatively efficient retail pricing. It is therefore impossible to consider allocative efficiency in isolation from competition.

6.40 In summary, we do not consider that theoretical considerations of allocative efficiency provide a strong reason to prefer MTRs above LRIC rather than at LRIC. This is all the more so when recognising the interplay between economic efficiency and competition effects noted in the preceding paragraph. Even if some mark-up over LRIC were theoretically desirable (which we do not think it is, not least given the implications for effective competition), attempts to calculate the optimal MTR would be extremely complex and therefore in our view disproportionate to the potential benefits of doing so.

6.41 The goal of setting an 'optimal' MTR would be to induce efficient retail pricing, and there is a wide theoretical literature presenting different models of how MTRs influence retail prices. These models depend on restrictions which may not always accurately reflect reality, and on multiple parameters that are difficult to quantify with any precision. The recent literature typically suggests that the socially optimal MTR is below that which would be chosen by profit maximising firms, but the papers differ in their conclusions about the exact level of optimal MTRs.[229] In reality, the relationship between MTRs and retail prices will be even more complex than in these models.

6.42 In light of the above, any attempt to fine-tune MTRs above or below LRIC for allocative efficiency reasons is likely to involve spurious accuracy and risks decreasing allocative efficiency. Furthermore, any mark-up above LRIC would distort

---

termination from fixed and international rose from around 2:1 in 2009/10 to around 2.5:1 in 2013/14. (Sources: 2013/14 volumes from Ofcom calculations based on s135 responses from MCPs; 2009 volumes from Ofcom calculations based on s135 responses to the 2011 MCT review (see March 2011 statement, footnote 782).

[227] Ofcom, *Wholesale mobile voice call termination Market Review*, April 2010, paragraphs A12.67-A12.75.

[228] Harbord, D. and Hoernig, S., *Welfare Analysis of Regulating Mobile Termination Rates in the UK*, May 2014, Journal of Industrial Economics and Hoernig, S., *Competition between multiple asymmetric networks: Theory and applications*, 2014, International Journal of Industrial Organization.

[229] For example in Julien et. al. (2013) optimal MTRs are above LRIC because the model assumes elastic market subscription. In Hoernig (2014) and Harbord and Hoernig (2014), the optimal MTRs are bellow LRIC because the model assume call externalities. See Harbord, D. and Hoernig, S., *Welfare Analysis of Regulating Mobile Termination Rates in the UK*, May 2014, Journal of Industrial Economics, and Hoernig, S., *Competition between multiple asymmetric networks: Theory and applications*, 2014, International Journal of Industrial Organization, 32, 57-69.

competition (as discussed later in this section) and this is likely to be detrimental to allocative efficiency.

Allocative efficiency – empirical considerations

6.43 Vodafone, EE and Telefonica suggest that fixed CPs (BT in particular) have not significantly adjusted their retail pricing to reflect recent changes in wholesale MTRs. In their view, the lower this 'pass through', the less likely it is that fixed to mobile call volumes will be distorted by MTRs above LRIC. Telefonica, in its report by Alix Partners, also argued that in contrast, there had been retail price increases for low usage mobile customers.[230] These MCPs argued that empirical considerations therefore suggest that lowering MTRs from their current level would be worse for allocative efficiency, as prices in the mobile industry would increase but there would be little reduction in price in the fixed industry.

6.44 Our view is that there has been some pass through to consumers in fixed markets. This is discussed in Annex 5. Annex 5 also shows that although there may have been retail price increases for some low usage mobile customers, prices across the mobile market as a whole do not seem to have risen in real terms despite the reduction in MTRs.

6.45 Moreover, as discussed earlier (in paragraphs 6.34 to 6.37), MTRs above LRIC may reduce allocative efficiency in mobile markets, because MTRs above LRIC distort MCPs' pricing incentives. This can be harmful even where it leads to a reduction in prices for some consumers – i.e. the price cut is offset by price increases for other consumers which could decrease allocative efficiency.

Do allocative efficiency considerations suggest there is an asymmetric risk from using LRIC as opposed to MTRs above LRIC?

6.46 Telefonica, EE and Vodafone each argued that modelling errors resulting in an MTR below LRIC would be more harmful than modelling errors resulting in an MTR above LRIC. They suggested we should therefore select variables that would lead to a higher estimate of LRIC, or use a cost standard above LRIC.

6.47 Telefonica and EE argued that it would be less risky to set MTRs above LRIC than at LRIC. This is because they consider that the optimal MTR lies above LRIC and so setting prices below LRIC leads to a decrease in welfare and setting prices above LRIC would lead to an increase in welfare, at least for small changes away from LRIC. EE argued that there were limited risks to allocative efficiency of above LRIC MTRs. On the other hand, it argued that if modelling errors meant that MTRs were below LRIC, it would reduce dynamic efficiency and create incentives for operators to move to lower quality MCT services (for example, with lower acoustic call quality and greater call drop rates).

6.48 As outlined earlier in this section, we do not agree that the optimal MTR necessarily lies above LRIC. MTRs above LRIC may decrease welfare. If the optimal MTR from the point of view of allocative efficiency is at LRIC, then there will be symmetric effects on allocative efficiency from errors that mean the MTR turns out to be above LRIC, and those that result in the MTR being below LRIC.

---

[230] http://stakeholders.ofcom.org.uk/binaries/consultations/mobile-call-termination-14/responses/Telefonica_AlixPartners_report.pdf

6.49 Furthermore, we do not believe that the plausible scale of any potential modelling error that might lead to MTRs below LRIC is likely to lead to any significant reduction in allocative efficiency, or that this effect could be mitigated by conservative modelling assumptions without the possibility of creating harm to allocative efficiency by creating too great a mark-up over LRIC. [231]

6.50 We also do not consider, as EE suggests[232], that MTRs set below LRIC would lead to incentives to adopt alternative lower quality, lower cost, models of service provision thereby undermining consumer choice. In our view there is likely to be an incentive to maintain call quality. We deal with EE's suggestion that investment incentives could be harmed through an MTR cap at LRIC or by modelling error that led to MTRs below LRIC, in the sub-section below on dynamic efficiency.

6.51 Vodafone also presented arguments, by Frontier Economics, which suggested that Ofcom should be conservative in its cost modelling to avoid harm to allocative efficiency. We have understood their arguments as follows:

6.51.1 Should MTRs fall *below* LRIC, some net receivers of calls, who are not currently making a significant contribution to common costs, will no longer provide revenues sufficient to meet the incremental costs of serving them. The most likely response is for MCPs to increase prices to these consumers. Frontier Economics seems to suggest that for pre-pay consumers this price increase may need to take the form of minimum top-ups rather than increases in call prices. In response, some pre-pay consumers may choose to leave the network rather than pay the higher price.

6.51.2 In contrast, should MTRs turn out to be *above* LRIC, then the consumers that would become more expensive to serve are those that are net makers of calls. Retail price increases for these consumers could take the form of increased call prices (rather than minimum top-ups). The response of those consumers could therefore be to reduce the number of calls they make, rather than to leave the network altogether.

6.51.3 Frontier Economics argues that the first effect on consumption is more harmful for efficiency than the second. Frontier Economics do not explain why this is so, but it could follow if the exit of a consumer from the market were to the detriment of other remaining consumers (which would be the case if there were significant network externalities).

6.52 We do not consider these arguments to be compelling. We consider that any increase in minimum top-ups for consumers, who are net receivers of MTR-affected calls, are likely to be small. As set out earlier, we also consider that the elasticity of

---

[231] For example, the gap between the upper bound and base case of our LRIC estimate would require a price increase of less than £0.60 per adult mobile phone user per year if fully passed through into retail prices. This assumes that the revenue effect of reduced MTR revenue is fully passed through into increased retail prices (a full waterbed). There is a gap of 0.16 ppm between the upper bound and base case LRIC in our model for 2015/16, net termination (i.e. from fixed and international calls) of 16.72 bn minutes, an adult population in 2013 of 51 million (ONS) and mobile phone use by 93% of adults (Ofcom, *Communications Market Report 2013*, 1 August 2013. http://stakeholders.ofcom.org.uk/binaries/research/cmr/cmr13/2013_UK_CMR.pdf).

[232] EE, *Mobile call termination market review 2015-2018. EE response to Ofcom's consultation: clarification note*, 8 October 2014.

subscription in the market is likely to be low, and that consumers are unlikely to exit in response to small price rises. Moreover, we consider that network externalities from the most marginal customers may be small, and that it is unlikely that MCPs will actively look to stop serving pre-pay consumers. This is because a large proportion of costs of serving these consumers are incurred in customer acquisition, so that the forward-looking cost of serving such consumers is low, and revenues per subscriber are unlikely to be driven below forward looking incremental costs per subscriber as a result of MTR reductions of the level contemplated.[233] As described in paragraphs 6.113 to 6.193 we do not believe that ownership will be significantly affected if we continue to regulate MTRs at LRIC (rather than setting them at LRIC+), and neither do we believe that any potential forecast modelling errors would be likely to have a significant effect on allocative efficiency.

6.53 We therefore do not believe that the harm to static efficiency is significantly greater if MTRs, through any potential modelling error, are slightly below LRIC than if they are slightly above.

Conclusion on allocative efficiency

6.54 We remain of the view proposed in our June 2014 Consultation that allocative efficiency considerations do not provide any strong reason to prefer MTRs at LRIC+ over MTRs at LRIC.

6.55 We also do not consider it appropriate to adopt alternative ways to determine a mark-up over LRIC, including attempting to calculate some form of Ramsey price or leaving MTR mark-ups at the current level. Any gains from trying to fine-tune allocative efficiency are unlikely to be large and, because there is so much uncertainty over the model and parameters that could be used to determine the 'optimal' MTR, any mark-ups risk being arbitrary and decreasing allocative efficiency. Furthermore, any mark-up over LRIC would distort competition and would be detrimental for allocative efficiency in the long-run.

6.56 Finally, we consider that the impact of potential modelling errors on allocative efficiency which result in an MTR cap that is either above, or below, the out-turn level of LRIC, is likely to be small and there are no reasons to expect any significant asymmetry.

Economic efficiency: Dynamic efficiency

Summary of proposals in June 2014 Consultation and stakeholder responses

6.57 Whereas static efficiency is concerned with the optimal production and consumption of currently available goods and services, dynamic efficiency is concerned with the levels of investment and innovation which, over time, act to reduce costs or improve quality for existing services, and/or introduce new products and services. Such investment and innovation is efficient whenever the expected cost of the investment is less than the expected benefits.

6.58 Increasing competition generally acts to increase dynamic efficiency by encouraging firms to invest and innovate in order to get ahead of their competitors. The impact of the cost standard on competition is considered in the next sub-section. Here we

[233] A similar point was made by the CC in its 2012 CC Determination at paragraph 2.748-2.749.

consider whether there are other reasons why the cost standard might affect dynamic efficiency.

6.59 In our June 2014 Consultation, we stated that we did not believe that investment and innovation outcomes would be expected to be, or have been, any worse under LRIC than LRIC+.

6.60 In response, EE and Vodafone said that they believed dynamic efficiency would be harmed by the use of LRIC, rather than LRIC+ (or some other cost standard above LRIC). Telefonica, in a report commissioned from Alix Partners[234], stated that it did not expect dynamic efficiency considerations to be as important as static efficiency and competition effects.

6.61 EE said that it thought the risk to dynamic efficiency was asymmetric, in that if modelling errors led to an MTR below LRIC it would be much worse for dynamic efficiency than if modelling errors led to an MTR above LRIC. Vodafone also made this argument.

6.62 H3G argued that LRIC MTRs would increase competition and this would generally increase investment, except if the intensity of competition is so great that firms are unable to make an economic profit on efficient investments. H3G believes that UK MCPs are currently unable to make an economic profit on their cumulative past investment, and that this may be due in part to MTRs at LRIC increasing competition. However, it stated that rather than increase MTRs it would be appropriate to address this in other ways which are less distorting to competition and more allocatively efficient.

How might MTR reductions affect investment?

6.63 We now consider how, in theory, MTRs at LRIC rather than LRIC+ affect net revenues, and how changes in net revenues may affect investment.

6.64 If MTRs were reduced from LRIC+ to LRIC, we would expect the following effects on the mobile industry's net revenues:

6.64.1 First, there would be revenue reductions, which would occur if there were no increase in retail prices. The fall in MTR revenues from fixed to mobile and international to mobile calls would lead to a reduction in mobile industry net revenue. The fall in MTR revenues from M2M traffic would have no effect on total mobile industry net revenue (since payments balance out at the industry level), but could lead to a redistribution across MCPs.

6.64.2 Second, there may be waterbed effects on retail prices. The loss of revenue from fixed to mobile and international to mobile MTRs may be counteracted by retail price increases, as MCPs seek to recover the lost margin on MTRs from the retail-side of the market. The more competitive is the mobile market, the greater we would expect this waterbed effect to be.

6.64.3 Third, there may also be competition effects. We would expect the reduction in MTR margins (over LRIC) to increase competition in the mobile sector through the competition effects we describe later in this section. All

[234] See footnote 230.

else being equal, this would be expected to lead to a reduction in retail prices. There may also be an increase in the constraint on the mobile sector from the fixed sector, which could lead to increased competitive pressure on call prices. The latter could occur because the fall in MTRs would reduce the marginal call costs faced by fixed CPs, which may be passed into lower retail call prices in the fixed sector (although on the available evidence, we would expect this to be a less strong effect than that stemming more directly from lower MTRs on competition between MCPs).

6.65 The observed changes in mobile industry profits (or the 'profits waterbed') will therefore initially depend on the balance of the following factors:

- waterbed effects which will tend to maintain industry profits (in the face of reductions in revenue from fixed to mobile and international to mobile calls), and would be expected to be stronger in a more competitive market;
- increased competition effects as MTR margins are reduced – which will tend to reduce industry profits if they are initially above the competitive level;
- other changes affecting the industry – for example, if the net result of the two preceding factors is overshadowed by annual changes in mobile industry costs the "observed" effect on retail prices and profits will be difficult to detect.

6.66 EE, Vodafone and Telefonica argued that MCPs may also reduce their costs or investments in response to lost revenue, and that this is harmful for dynamic efficiency. EE's and Vodafone's responses to our analysis of dynamic efficiency focused on the idea that MTR cuts would reduce profitability because of an incomplete waterbed effect. Their responses appear to assume that lower profitability would lead to lower investment.

6.67 We firstly note it is not appropriate to maximise investment at all costs – instead the objective should be to encourage efficient investments that provide benefits to society which are greater than their cost. Further, economic theory does not suggest that there is an automatic relationship between profitability and dynamic efficiency. For example, a monopolist may have high profits but may not invest as much as if it faced competition. We consider that higher profits are more likely to be important for risky investment and innovation, whereas the infrastructure associated with call termination is not likely to fall into this category, because it is not a new or innovative service.

6.68 Vodafone seems to suggest that reduced profits would mean a reduction in the funds available for investment, so that further investment in one area could only be undertaken at the expense of investment in other areas. However, we think that if MCPs have investment opportunities with expected returns at least as great as the cost of capital, they will be able to fund those through capital markets.

6.69 It is possible that these stakeholders believe that higher MTRs would lead to higher investment because the margin on MTR revenue from fixed and international calls to UK mobile numbers (which represents a net inflow to the UK mobile sector) would be competed away through investment. However, it is not clear why the margin on termination would necessarily be used for investment in MCT or mobile networks more generally, rather than being spent on customer acquisition or retention. Moreover, if the waterbed effect on retail prices is incomplete, MCPs may choose to retain at least some of the margin as profits.

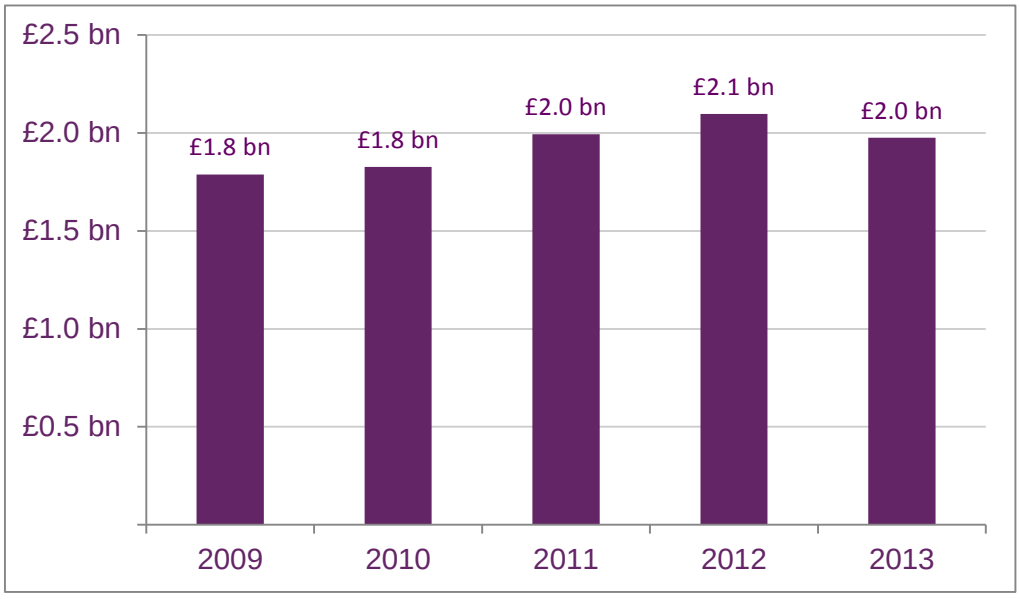
6.70 There was also some suggestion that returns on past investments would be unexpectedly reduced, thereby disincentivising future investment. EE, for example, suggested that if MCPs do not have the opportunity to earn a return on previous investments it will affect their willingness to invest in the future. We do not find this argument convincing. For example, investments made since 2011 have been made under a charge control on a trajectory to LRIC (first by 2014 and then, following appeal, 2013). In any case, MCPs have the ability to recover their costs, including the cost of capital, through retail prices.

6.71 Finally, Vodafone, Telefonica and EE made some comments about the risk of lower returns on future investment. We agree that if lower MTRs reduced the return on future investment, this may have an impact on incentives to invest if the waterbed effect is incomplete. With an incomplete waterbed effect, lower MTRs imply that there will be a slightly lower return on any investment relevant to termination. This could disincentivise investment if returns fall below the forward looking cost of capital. However, we do not find this concern compelling for the reasons set out below.

Empirical analysis suggests no historical impact on investment

6.72 We see no empirical evidence to suggest that investment is harmed by MTRs at LRIC rather than LRIC+. In the UK from 2009 to 2012 MCP capex rose (from £1.8bn to £2.1bn) despite very large reductions in MTRs over that period. In real terms capex fell slightly in 2013 compared to 2012, to the same level as in 2011, but above the levels in 2009 and 2010.[235]

Figure 5: Capex by the four largest MCPs 2009-2013 (£bn, 2012/13 prices)



Source: Ofcom, based on Company financial reports (H3G did not publish UK reports before 2010), excluding spectrum fees. Vodafone figures relate to the year ending March 31st following the year shown.

[235] We also note that there are countries with lower MTRs than the UK, without evidence that investment has materially suffered. As of 2012, the United States, Canada, France, Sweden and China were among the countries with lower MTRs than in the UK (see OECD (2012), Developments in Mobile Termination", OECD Digital Economy Papers, No. 193, OECD Publishing. http://dx.doi.org/10.1787/5k9f97dxnd9r-en

6.73 Investment and innovation in both networks and services has continued apace. For example, since 2011 we have seen deeper RAN sharing, investment in S-RAN, investment in improved backhaul, improved mobile data speeds and coverage[236], comparable levels of voice coverage and quality[237], and continued take-up and promotion of handsets offering advanced functionality (i.e. smartphones). While these investments and innovations will have been driven by a variety of factors, the fact that such significant investment/innovation has continued strongly suggests that investment and innovation have not been adversely affected by the move to MTRs at LRIC.

6.74 EE commented that we needed to do more than just prove that investment had not decreased under LRIC; we needed to show that it would not have been higher under LRIC+. We disagree, since (as noted in paragraph 6.67) Ofcom's goal is not to maximise investment at all costs. We have set out above our arguments in principle for why a LRIC+ rather than a LRIC MTR would not necessarily be expected to lead to an increase in investment. As we discussed in the June 2014 Consultation, market developments provide some indication of the empirical effects of moving to LRIC-based MTRs but we cannot establish causality with certainty. Therefore the empirical analysis alone cannot tell us with certainty precisely what would have happened had we chosen a LRIC+ cost standard rather than LRIC over the last four years. Nonetheless, the empirical evidence suggests that there does not seem to have been a significant change in the trend in investment when MTRs moved to LRIC, which is supportive of our view that we would not necessarily expect a LRIC+ MTR to lead to an increase in investment compared to a LRIC MTR.

Financial impact of LRIC rather than LRIC+ is relatively small

6.75 The maximum net effect on MCPs' revenue from an MTR at LRIC rather than LRIC+ is therefore relatively modest – around £65 million in 2015/16.[238] This is less than 2% of EBITDA and less than 3% of EBITDA minus capex for the largest four operators.[239] These effects are likely to be further reduced by the opportunity to recover lower revenue or margin on MCT from the retail side of the market.

---

[236] Ofcom, *Infrastructure Report, 2013 Update,* 24 October 2013 (updated on 6 December 2013), Paragraphs 4.34-4.38. http://stakeholders.ofcom.org.uk/binaries/research/telecoms-research/infrastructure-report/IRU_2013.pdf

[237] Ofcom, *Infrastructure Report, 2013 Update,* 24 October 2013 (updated on 6 December 2013), Paragraphs 1.22-1.23. http://stakeholders.ofcom.org.uk/binaries/research/telecoms-research/infrastructure-report/IRU_2013.pdf. We noted however that, despite coverage levels not having changed significantly over the past year, mobile operators have embarked on major upgrades and reconfigurations of their networks.

[238] This is based on the modelled gap between LRIC and LRIC+ of 0.39 ppm in 2015/16 and net termination volumes from fixed and international calls of approximately 16.72bn. We note that Vodafone submitted that Ofcom had not calculated LRIC+ with sufficient accuracy. See Annex 8 (Section 5.3 of the Analysys Mason report) for Analysys Mason's response to this point.

[239] Based on MCPs' public accounts and Ofcom analysis. Comparison of the net loss of MTR revenue to EBITDA less capex is intended to illustrate that the net loss of MTR revenue is small in relation to the sustainable cash flows of MCPs. Vodafone has suggested that we should compare the net loss of MTR revenue to EBIT. However, EBIT includes amortisation of historic licence costs, which in the case of 3G licences can be based upon balance sheet asset values significantly higher than likely current value, and amortisation of intangible assets added to the balance sheet following M&A activity rather than assets resulting from capital expenditure in the business. We note that EBITDA-capex has been stable over a number of years, as shown in Figure 6. We do not use EBITDA less capex as a definitive measure of profitability, but consider it is a reasonable indicator of the sustainable cash flows that can be generated by MCPs.

6.76 EE and Vodafone stated that the opportunity to rebalance cost recovery to the retail side of the market would be affected by Ofcom's recent guidance on General Condition 9.6 (GC9.6).[240] They argued that increasing prices for pay monthly customers would therefore risk early termination of contracts by customers and potentially leave MCPs unable to recover their substantial investments on customer acquisition. They argued that this makes it more difficult for them to change retail prices and thus more difficult to recover the lost contribution caused by lower MTRs. However, GC9.6 does not prevent retail price changes in all circumstances. For example, MCPs would be able, without undue constraint by GC9.6, to adjust the tariffs for new customers and top-up charges for pre-pay customers, if they chose to do so. In any case, if the effect of GC9.6 was to significantly delay any waterbed effect, that could be an argument for delaying the period over which MTRs are reduced, but it is not an argument to change the choice of cost standard per se.

6.77 EE and Vodafone also argued that recent academic evidence presented by Genakos and Valletti shows that the waterbed effect has disappeared.[241] In this paper the authors find that the waterbed effect has disappeared on average across all 27 countries in their sample, for two reasons. First, MTRs are now much lower than at the time of the first (2011)[242] Genakos and Valletti study that used data up to 2006, and second, because most of the new countries that introduced this termination rate regulation after 2006 did so at a moment when fixed and international calls account for a smaller proportion than previously of calls to mobile devices; as a result, MTRs account for much less of total MCP revenues than before and the waterbed effect for these countries is not existent. However, the authors' results seem to indicate that on average the waterbed effect is still present for the countries, such as the UK, that introduced MTR regulation before 2006, although the waterbed has reduced significantly over time.[243]

6.78 However, even if the waterbed effect in retail bills is no longer so clearly discernible, it does seem that MCPs have managed to retain stable profits and margins in the UK; as shown in Figure 6 below (see Figure 14 further below for the EBITDA-capex margin on sales). This suggests that cost reductions have mitigated the need for retail price increases.[244]

---

[240] Under GC9.6, where a price increase would result in "material detriment" to the consumer, a CP must notify the consumer of the change and give them the right to terminate the contract without penalty. In Ofcom's guidance on 'material detriment' under GC9.6 in relation to price rises, we explain that we are likely to treat any price increase to the agreed core subscription price during the fixed term of a contract as a modification that is likely to be of material detriment to consumer and small business subscribers for the purposes of GC9.6. See Ofcom, *Price rises in fixed term contracts: Decision to issue Guidance on General Condition 9.6,* 23 October 2013, Annex 1 Guidance on "material detriment" under GC9.6 in relation to prices and notification of contract modifications: http://stakeholders.ofcom.org.uk/binaries/consultations/gc9/statement/guidance.pdf

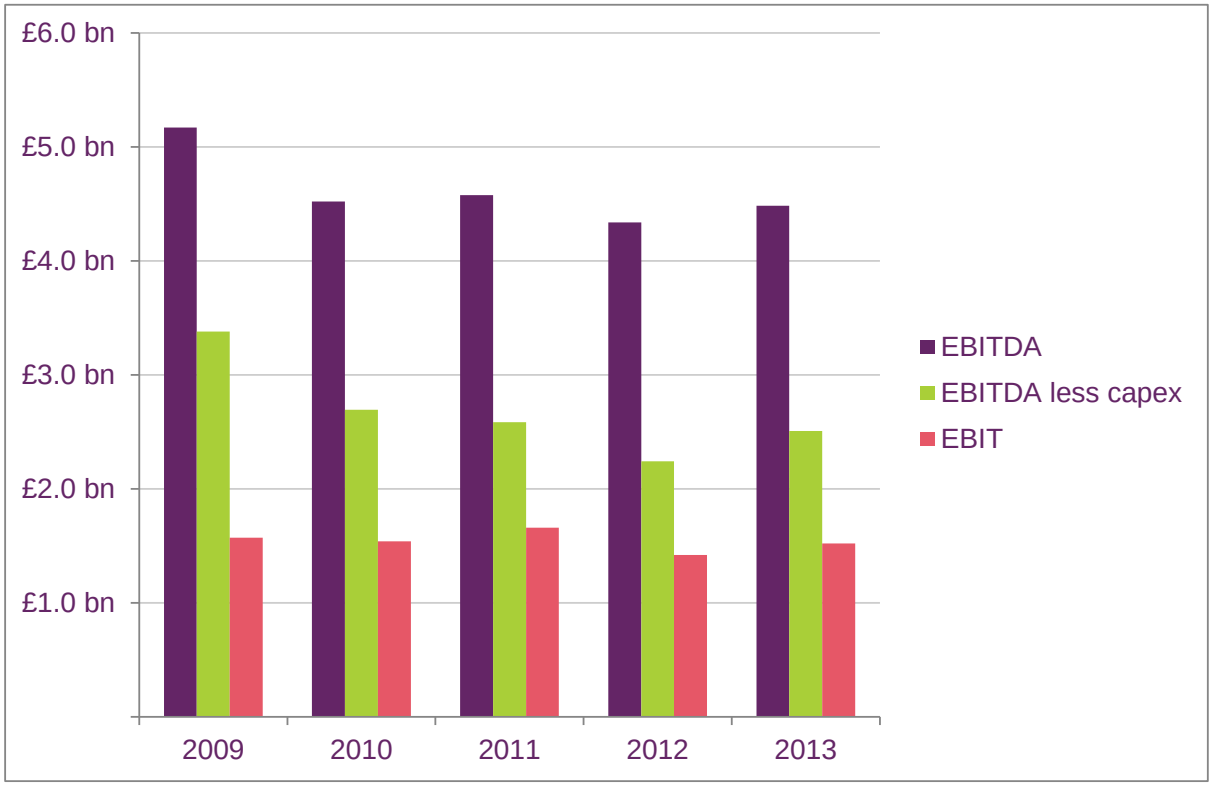
[241] Genakos, C. and T. Valletti, 2015, 'Evaluating a decade of mobile termination rate regulation', Economic Journal (forthcoming), Doi: 10.1111/ecoj.12194 Working paper available at http://cep.lse.ac.uk/pubs/download/dp1282.pdf (Genakos and Valletti, 2015)

[242] Genakos, C. and Valletti, T. (2011), Testing the "waterbed" effect in mobile telephony. Journal of the European Economic Association, 9: 1114–1142. doi: 10.1111/j.1542-4774.2011.01040.x

[243] Genakos and Valletti, 2015, paragraph 3 on page 11.

[244] The equipment unit cost trends used as inputs of the 2015 MCT model are negative in real terms for most assets. In addition, technological developments included in the 2015 MCT model (including the introduction of 4G technology and VoLTE, use of infrastructure sharing and S-RAN deployment) reflect network deployments that lead to lower service unit costs. Genakos and Valletti (2015) also

Figure 6: Aggregate profitability indicators for largest four MCPs, 2012/13 prices



Source: Ofcom, based on Company financial reports (H3G did not publish UK reports before 2010).Vodafone 2013 figure adjusted to exclude estimated impact of C&W. Vodafone figures relate to the year ending March 31st following the year shown.

6.79 Even if the waterbed effect were lower than at the time of the last review, the impact on profitability would still be smaller than at that time. This is because the estimated difference between the 2011 estimates of LRIC and LRIC+ in 2014/15 was around 1ppm,[245] compared with an estimated difference now of around 0.4ppm (in 2015/16, in 2012/13 prices) and slightly lower net termination volumes today.

Current levels of profitability do not change our assessment

6.80 MCPs have suggested that the effect on dynamic efficiency, from setting MTRs at LRIC rather than LRIC+, may be particularly marked in the current environment.

6.81 Vodafone said that the cumulative effect of our regulation had a significant impact on profitability and investment, mentioning, in particular, the impact of the proposed Annual Licence Fees (ALF) on profitability. In response we note that Ofcom's revisions to ALF remain under review and we will take all relevant considerations into account in reaching our final decision on ALF, pursuant to the Government direction..

---

argue that cost reductions may have counteracted some of the effects on MCP profits of MTR reductions. Controlling for cost reductions that are common across countries over time (through dummy variables for each year), they do not find evidence that profits of mobile operators have been affected by regulatory cuts in termination rates. See Genakos and Valletti, 2015.

[245] Based on Ofcom's 2011 MCT cost model, expressed in 2012/13 prices,

6.82 We also note that not all recent regulatory changes affect MCP cash flows adversely. For example, MCPs now pay to fixed CPs termination rates set at LRIC.[246] This is worth a little over £60 million a year to MCPs, relative to FTRs at LRIC+.[247]

6.83 Several stakeholders said that we should consider returns in the industry more generally. EE, for example, suggests that we have failed to consider the level of returns on capital employed which the industry is currently making. Vodafone points to a report by Enders Analysis, which observes that UK mobile network capex levels are behind those of operators in other developed countries outside Europe and that revenue growth, EBITDA margins and cash flow margins are below the fixed industry.[248]

6.84 However, we do not think that MTRs at LRIC will drive returns below the cost of capital. First, the projected LRIC includes a return on capital set at the cost of capital of an average efficient MCP. Second, the recent auction of mobile spectrum has revealed a large positive willingness to pay for new spectrum licences, at a time when MTRs were regulated on a glidepath to LRIC, and due to be set at LRIC from April 2013.[249] Such bids would only have been made under the expectation that the returns on the investment would exceed the cost of financing it. Insofar as a LRIC rather than LRIC+ cost standard reduces the return on investments, and was foreseen, the auction will also have acted as a "shock absorber", since a reduction in expected returns would have reduced the level of bids made.

Ofcom's analysis of dynamic effects: Is there an asymmetric risk?

6.85 EE and Vodafone argued that if the modelled estimate of LRIC is lower than the actual level of LRIC, operators will incur a loss on every minute of voice termination they supply, and this will have serious impacts on ongoing investment. In their view, however, if the MTR cap (based on the modelled LRIC) is above the true level of LRIC it will do little harm.

6.86 In our view, modelling errors are most unlikely to have a significant effect on the return on investment. First, revenues can be recovered from the retail-side of the market. Second, even if a waterbed effect in retail prices is incomplete, the impact of any potential modelling error (through reductions in MCP revenue from fixed and international calls) is likely to be modest in the context of a £15.6 billion industry.[250] For example, from the scenarios considered in Annex 12 the "high" cost scenario produces an estimate of LRIC around 0.16 ppm higher than our base case LRIC (in each year of the control period). As a result, in the event that the base case LRIC were to turn out to be below the out-turn LRIC by the full extent of this "high" cost

[246] See 2013 FNMR Statement.
[247] This is based on approximately 32.4bn minutes of mobile-to-fixed UK calls in 2013 and a difference between the estimate of LRIC and LRIC+ for FTRs, of 0.194ppm. See Ofcom, *Telecommunications market data tables Q2 2014*, published 20 November 2014 ('Ofcom Data Tables Q2 2014') and 2013 FNMR Statement, paragraph 8.28.
[248] Enders Analysis, *UK 2G licence fee proposals: Higher and higher*, 16 January 2014. http://stakeholders.ofcom.org.uk/binaries/consultations/900-1800-mhz-fees/responses/Enders_Analysis.pdf
[249] The February 2013 auction of the 800 MHz and 2.6 GHz spectrum bands raised £2.4 billion from the sale of licences for 250MHz of band width – see http://stakeholders.ofcom.org.uk/binaries/spectrum/spectrum-awards/awards-in-progress/notices/4g-final-results.pdf
[250] CMR 204, figure 5.40.

scenario, the probability of which we believe to be low, the estimated net revenue loss would be less than £30m p.a. across all MCPs.

6.87 Moreover, most investment decisions at the network level are made over a longer timescale than that of an MTR review period. This means that the probability that, across the relevant asset life, MTRs will be below LRIC on average, is lower than the probability of this occurring in a single review period. Stakeholders noted that, in our 2007 MCT Statement, we considered there was an asymmetry in risks in relation to dynamic efficiency, and suggested that this supported a charge control level above the midpoint of the range of benchmarks to avoid the possibility of under-recovery. However, in recognition of the two-sided nature of call termination (i.e. the opportunity to recover costs on the retail-side) and other arguments set out in this section (in particular the small difference between LRIC and LRIC+ on the net revenues of MCPs and the importance of MTRs for competition), we do not think there is an asymmetry of risks which requires us to aim above our central estimate of the costs of MCT. Moreover, in the appeal of our 2007 MCT Statement, the CC stated that dealing with asymmetry of risk by applying a higher charge cap shifts the burden onto FCPs and their customers and it considered that this is particularly relevant given that the benefits of the investments which such an upward adjustment would be seeking to encourage would accrue to the MCPs, not the FCPs.[251]

6.88 Vodafone referred to our statement in the June 2014 MCT Consultation in the context of discussing glide paths, where we said we would be concerned if MTRs were set below LRIC at any point during the charge control period and therefore, in the event that MTRs at the start of the period were below LRIC, we would make a one-off upwards adjustment to LRIC so that MCPs would be able to recover the LRIC of providing MCT.[252] It is true that we would wish to avoid a situation where the MTR cap is below our best estimate of LRIC for the reasons set out in our June 2014 Consultation. However, we would also be concerned if MTRs were above our best estimate of LRIC. We acknowledge that our best estimate of LRIC may not turn out to be the true LRIC of an average efficient MCP, since it is not possible to entirely avoid forecast error given that there will be some level of uncertainty in the assumptions that we make for modelling purposes. However, we have used our best estimates for an average efficient MCP and in order to make our model as robust as possible, we have calibrated it against actual asset counts and accounting costs for the 2G/3G/4G national MCPs back to 2010.

6.89 In the report by Towerhouse LLP (Towerhouse) submitted by Vodafone, Towerhouse argued that we previously rejected cost standards below LRIC in the consultation phase of the 2011 Review because they may disincentivise investment. However, the relevant discussion in the April 2010 MCT Consultation considered certain options (mandated reciprocity of MTRs and FTRs and mandatory bill and keep) that were ultimately rejected primarily on the grounds that they would have been expected to involve setting a cap on MTRs below LRIC and therefore below the expected cost of providing MCT.[253] When regulating on the basis of LRIC, the cap is set by reference

[251] See paragraph 2.9.166-169, *Determination of the Competition Commission Reference under section 193 of the Communications Act 2003: Hutchison 3G UK Limited v Office of Communications, Case 1083/3/3/07 British Telecommunications plc v Office of Communications, Case 1085/3/3/07, Mobile phone ,wholesale voice termination charges,* 16 January 2009, http://www.catribunal.org.uk/files/CC_Determination_1083_H3G_1085_BT_220109.pdf

[252] See paragraphs 8.77 to 8.79 of the June 2014 Consultation.

[253] See paragraphs 7.36 and 7.56 of the April 2010 MCT Consultation. We noted that this may give rise to concerns with compatibility with the EC framework. However, we foresee no such concerns

to our best estimate of the projected average efficient LRIC of MCT – we would not be setting MTRs at a level that we know to be, or expect to be, below the LRIC of MCT (including the cost of capital on those investments).

6.90 We note that Frontier Economics, in a report for Vodafone, say that there is no significant asymmetry of risk to dynamic efficiency and Alix Partners, in a report for Telefonica, suggested dynamic efficiency more generally was a lesser consideration than allocative efficiency and competition.

Conclusion of Ofcom's analysis of dynamic efficiency

6.91 Taking into account the above, we consider that while LRIC+ might generate more revenue and potentially profit than LRIC for the mobile industry as a whole, it is unlikely to lead to significantly greater investment or more efficient investment overall. This is consistent with the empirical evidence which does not suggest that the reduction of MTRs down to LRIC has been associated with lower investment.

6.92 We also do not consider there to be a significant asymmetry of risk in terms of dynamic efficiency from being above or below the out-turn level of LRIC. This is because there is an opportunity to recover costs on the retail-side of the market and the impact of any potential forecast error is unlikely to be material in terms of MCPs' net revenues and/or incentives to invest.

Ofcom's Analysis of Competitive Effects

Summary of proposals in June 2014 Consultation and stakeholder responses

6.93 In our June 2014 Consultation we considered that LRIC+ MTRs dampened competition between MCPs and could act as a barrier to expansion for smaller MCPs. We considered the empirical evidence, which, in our view, suggested that the move to LRIC in 2011 had strengthened competition. We also considered that LRIC+ MTRs would make it harder for FCPs to compete with MCPs in the retail market.

6.94 EE, Vodafone and Telefonica argued that the choice between LRIC and LRIC+ (or any other MTR above LRIC) is likely to have a limited, or no, impact on competition.

6.95 In contrast, H3G and BT believed that LRIC MTRs did significantly increase competition and that the competitive impacts were the most important factor in the choice of cost standard. [✂], Verizon and Virgin Media all also agreed with our analysis of competition effects.

6.96 BT also commented that it does not believe there have been any significant changes since 2011 which would warrant a move away from LRIC. BT considered that, if anything, the need to protect competition is stronger given its recent entry (and the entry of other significant MVNOs) into providing more mobile retail services and the prospect of fixed to mobile convergence. [✂] also noted that LRIC+ risked creating a competitive distortion between the mobile and fixed sectors at a time when convergence is a growing reality.

---

with the setting of MTRs based on the forecast average efficient LRIC, which is the cost standard recommended by the European Commission for setting MTRs in the 2009 EC Recommendation.

6.97 Verizon commented that proposals implemented under the last review, particularly MTRs at LRIC, have proved effective in delivering benefits to the wider telecommunications industry and to end-users and that a distortion could occur if MTRs and FTRs were set by reference to different cost standards.

Introduction to competition effects

6.98 The retail-side of the UK mobile market is made up of four larger CPs, and a number of smaller CPs.

Table 9: Retail share of UK subscribers, Q2 2014

Vodafone	Telefonica	EE	H3G	Others
19%	26%	29%	10%	16%

Source: Ofcom/Operators

6.99 Below, we review the mechanisms through which MTRs could affect competition between CPs (first amongst MCPs and, second, between MCPs and FCPs, before presenting empirical evidence on how competition has changed over time.

6.100 In the June 2014 Consultation and the previous review (and subsequent appeals) attention focussed on three mechanisms affecting competition between MCPs, each of which is explained under the follow headings:

6.100.1 market-wide effects;

6.100.2 customer segment effects; and

6.100.3 retail effects arising from on-net/off-net price differentials.

Market Wide Effects

6.101 We consider that MTRs above LRIC, relative to MTRs set at LRIC, could reduce incentives for MCPs to compete on retail call prices (i.e. to offer lower retail call prices). The reason for this is that reducing retail call prices will lead to higher outbound calls to mobiles, and thus higher MTR outpayments, without leading to increases in inpayments. Such outpayments will also be higher, the higher the MTR. We refer to this as the market wide effect. We agree with H3G that this means that high MTRs could dampen incentives for MCPs to reduce retail call prices, irrespective of market shares.[254]

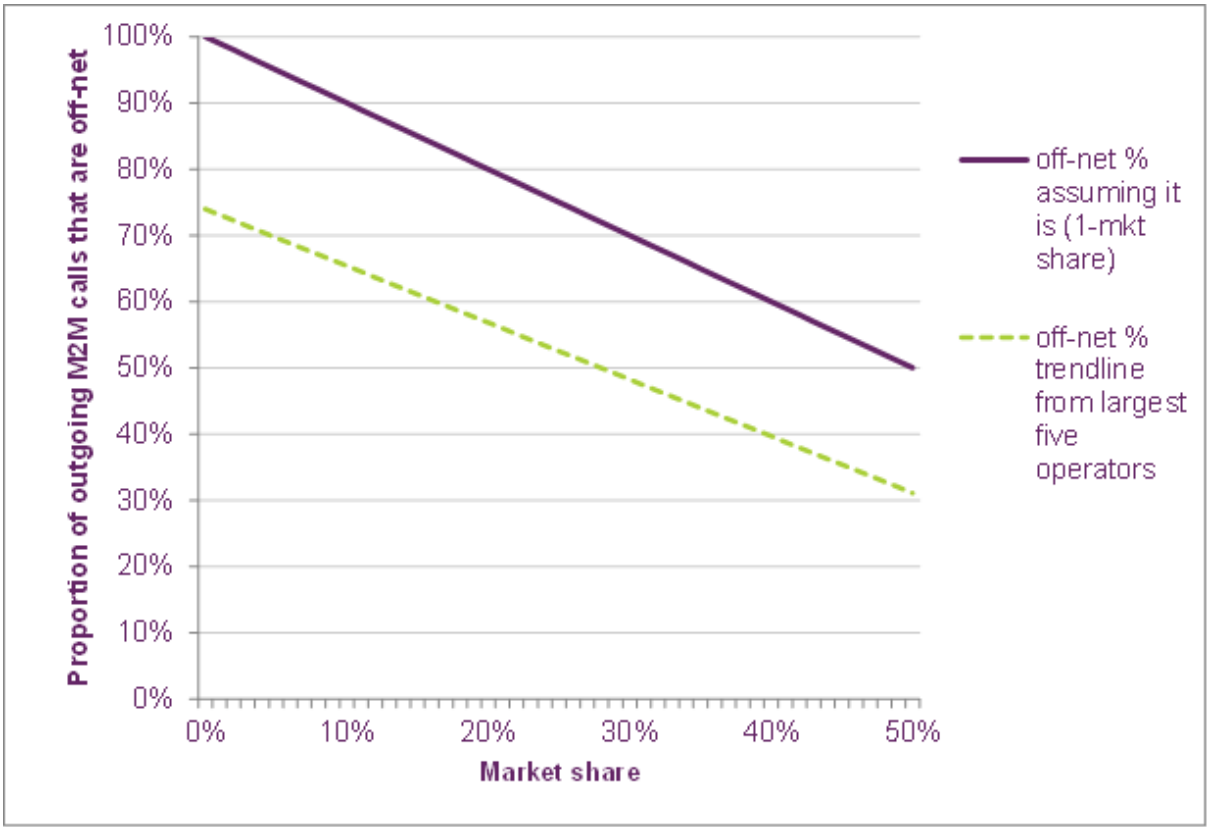
6.102 In addition, we believe that market share considerations could lead to a barrier to entry or expansion for smaller players, in that the dampened incentive to reduce retail call prices when MTRs are above LRIC is more pronounced for smaller MCPs. This stems from the fact that, although in some cases there is a distinction between on-net and off-net retail call prices, in many cases there is not. So lowering retail call

[254] While MTRs above LRIC may provide incentives to cut subscription or other prices not linked directly to usage, the literature suggests that such price cutting is not sufficient to counteract the effect on call prices. See, for example, Hurkens, S. and López, Á. L., 2014, 'Mobile Termination, Network Externalities and Consumer Expectations', The Economic Journal, 124: 1005–1039, Tangerås, T. P., 2014, 'Network competition with income effects', The RAND Journal of Economics, 45: 645–673, Hoernig, S., Inderst, R. and Valletti, T., 2014, 'Calling circles: network competition with nonuniform calling patterns', The RAND Journal of Economics, 45: 155–175.

prices generally leads to a greater volume of both on-net and off-net calls. The smaller the MCP, the greater the proportion of these additional calls (that arise from a reduction in retail call prices) that will go off-net. Thus a given increase in outbound calls (stimulated by a decrease in retail call prices) would be likely to lead to a larger increase in MTR out-payments for MCPs with a lower market share than for MCPs with a higher market share.

6.103 Figure 7 below shows the inverse relationship between an MCP's market share and the proportion of M2M traffic that is off-net. The proportion of off-net traffic shown by the solid line is given by the difference between the market share of subscribers and the MCP's own market share, e.g. a 25% market share is associated with a 75% proportion of off-net traffic. This assumes that each subscriber's propensity to call subscribers on another network is driven only by market shares. In practice, we recognise that other factors may drive calling patterns, as the data received from MCPs suggests less off-net calling than implied by their market share – as illustrated by the dotted line in Figure 7 below.

Figure 7: Relationship between market shares and off-net M2M calls[255]



Source: Ofcom/Operators

6.104 Vodafone and Telefonica argued that given the level of, and difference in, the estimates of LRIC+ and LRIC, it is questionable whether the choice between LRIC and LRIC+ for MTRs would have any measurable impact on the incentive to reduce retail prices. Telefonica also argued that the impact must be less than it previously

[255] Confidential figure also contains relationship between market share and off-net M2M calls of each MCP.

was given that the importance of calls in mobile bundles has decreased over time relative to the importance of data.

6.105 We accept that, compared to our 2011 MCT review, the market-wide impacts of choosing a LRIC rather than LRIC+ standard are likely to be lower, because the gap between these two cost standards is smaller than it was then. However, the volume of M2M calls is now greater than it was before, offsetting to some extent the reduced differential between LRIC+ and LRIC.

6.106 Moreover, our analysis suggests that a LRIC+ standard would still cause the perceived incremental cost of outbound of calls on average (including both origination and termination) to be higher than the true underlying incremental cost of calls. To illustrate this point, we have assumed that the true underlying incremental costs of origination and termination are the same (LRIC); that the incremental cost for the inbound leg (termination) of on-net calls is also LRIC; and that the perceived incremental cost of termination for off-net calls is equal to the MTR. The average cost of an outbound call is a weighted average of the cost of on-net and off-net calls.[256]

6.107 Figure 8 and Table 10 below show that with a LRIC+ MTR, the total perceived incremental cost to MCPs of providing outbound calls (on average across both on-net and off-net calls) may be around one-fifth to one-third higher than under a LRIC standard based on current MCP traffic volumes (the differential based on weighting by market shares is considered later). We think that this effect is large enough to be important.

Figure 8: Relationship between off-net M2M calls and the average incremental end-to-end cost of M2M calls

[✂]

Table 10: Relationship between off-net M2M calls and the average incremental end-to-end cost of M2M calls

	Virgin Media	H3G	Vodafone	Telefonica	EE
Market share of subscribers	4%	10%	19%	26%	29%
Off-net proportion	[✂]	[✂]	[✂]	[✂]	[✂]
Perceived costs, % above true costs	[✂]	[✂]	[✂]	[✂]	[✂]

Source: Ofcom calculations based on MCP data and 2015/16 costs from the 2015 MCT model, expressed in 2012/13 prices, based on 2014 call volumes submitted by the MCPs.

6.108 Figure 8 above also shows that the effects on the end-to-end call costs, from MTRs at LRIC+ rather than LRIC using the prevailing MTRs from April 2015, are typically greater for those MCPs for whom a higher proportion of outbound calls go off-net. As already discussed, these are likely to be MCPs with a smaller share of subscribers, although in practice the proportion of off-net calls is somewhat less than expected based on subscriber market shares alone.

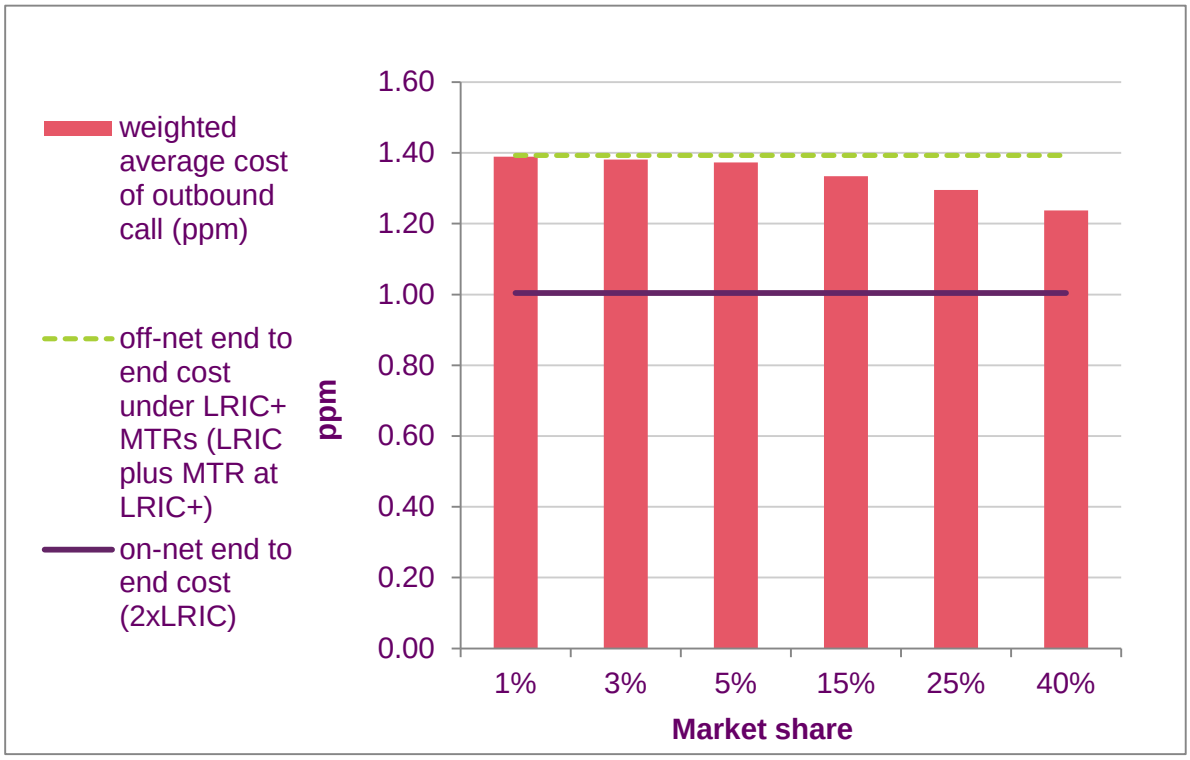
[256] The average cost of an outbound call = ((MCPs' on-net volumes proportion) x 2 x LRIC) + ((MCPs' off-net volumes proportion) x (LRIC + MTR at LRIC+)).

6.109 The tendency to have fewer than expected off-net calls could be driven by mitigation strategies (indeed perhaps motivated by MTRs which have been above LRIC until 2013) or factors beyond market shares and the marginal costs that may influence MCP pricing. We note that MCPs have a higher proportion of calls going off-net now than at the time of the previous review.[257] We consider that this is consistent with what might be expected when MTRs are reduced down to LRIC. Figure 9 and Table 11 below show how the average incremental cost of an outbound call could vary with market share, in the absence of such mitigation strategies.

6.110 For example, at MTRs using the LRIC+ and LRIC 2015 MCT model outputs for 2015/16, the average perceived incremental outbound call cost averaged across off-net and on-net calls would be around 40% above the true underlying incremental cost for an MCP with 5% or fewer subscribers. Even for an MCP with a 25% share of subscribers the average perceived incremental cost of an outbound call would be around one third higher than the true underlying incremental cost.

6.111 Therefore, the perceived incremental call cost averaged across off-net and on-net calls for an MCP with a 5% market share would, absent any mitigation strategies to reduce their customers' off-net calls, be just under 10% higher (by around 0.1ppm) than for a rival with a 25% market share of subscribers. For new entrants with even lower market shares, the difference would be greater still.

Figure 9: Relationship between market share and implied average incremental end-to-end cost of outbound calls under LRIC+ MTRs



Source: Ofcom calculations, using modelled results for LRIC and LRIC+ in 2015/16

[257] 57% in 2014 overall compared to 50% in 2011 (Ofcom telecoms data tables, Table 2, multiple years).

Table 11: Relationship between market share and implied average incremental end-to-end cost of outbound calls under LRIC+ MTRs

Market share	1%	3%	5%	15%	25%	40%
Implied off-net proportion	99%	97%	95%	85%	75%	60%
Perceived costs, % above true costs	40%	39%	38%	34%	30%	24%

Source: Ofcom calculations, using modelled results for LRIC and LRIC+ in 2015/16

6.112 The above discussion is of the effect of LRIC as compared with LRIC+, relative to underlying incremental costs. Vodafone and Telefonica instead compared the gap between LRIC and LRIC+ with the average retail price of calls, and suggested that in this context the gap is insignificant. We note that the effect of a LRIC rather than LRIC+ standard would be expected to be smaller now than in earlier periods, since the gap between MTRs set at LRIC and at LRIC+ is now smaller.[258] The cost increases above true incremental costs, shown earlier in Figure 8 for each MCP, amount to around 3-5% of the average price of a mobile call (although more if we consider the potential cost increase inferred from market shares rather than actual on-net and off-net traffic).[259] However, these effects are larger still as a proportion of cost (as illustrated earlier) and likely profit margins, which we consider to be at least as important in MCP pricing decisions as the level of retail prices alone.

6.113 In summary, we believe that with MTRs at LRIC+ there would be expected to be a reduced intensity of retail call price competition, relative to LRIC. This effect would be expected to be smaller for lower mark-ups over LRIC, but we consider that the effect remains.

Customer Segment Effects

6.114 We consider that, relative to MTRs at LRIC, LRIC+ MTRs would put smaller MCPs at a disadvantage in competing for customer segments which tend to be net makers of M2M calls (i.e. with more outbound M2M than inbound M2M calls), but at an advantage in competing for segments which tend to be net receivers of M2M calls.

6.115 This effect arises because MCPs with a lower market share will tend to pay more in MTRs for outgoing M2M calls, since a greater proportion of these calls will be off-net. On the other hand, since more incoming M2M calls will also be off-net originated calls, smaller MCPs will also receive more MTR payments. For customer segments that tend to be net makers of M2M calls, the result is that MCPs with a lower market share are at a competitive disadvantage from MTRs above LRIC. However, in

[258] The effect of MTRs at LRIC rather than LRIC+ will depend not only on the magnitude of the ppm gap between LRIC and LRIC+, but the volume of affected calls and how the cost of calls affects pricing and competition among MCPs given other strategic considerations.
[259] In 2013, the average retail price per minute of a post pay call was 8.7 ppm, and for pre-pay the figure was 6.3ppm. Ofcom, *Communications Market Report 2014*, 7 August 2014. http://stakeholders.ofcom.org.uk/binaries/research/cmr/cmr14/2014_UK_CMR.pdf, Figure 5.73, page 360. The post pay figure is an overestimate of the price of calls, since it is based on a calculation that includes the cost of inclusive messages and data allowances. Therefore for illustrative purposes we have used the pre-pay figure of 6.3ppm.

customer segments which tend to be net receivers of M2M calls, MCPs with a lower market share are at a comparative advantage when MTRs are above LRIC.[260]

6.116 Under LRIC, however, market shares do not affect an MCP's ability to compete in any customer segment based on the balance of outbound to inbound M2M calls. This is because with MTRs at LRIC the perceived incremental cost of outbound calls which terminate off-net is, in principle, the same as the incremental cost of an on-net call and, on the inbound side, termination revenues do not provide a margin over LRIC. Effectively, with MTRs at LRIC, no MCPs make any contribution to the common costs of their rivals. We refer to this as the 'competitive neutrality' of LRIC. In its response, BT argued that it was important that smaller MVNOs (which we take to mean smaller MCPs generally) can compete across all market segments on a level playing field, a point with which we agree.

6.117 At the time of the last review, we presented analysis showing that with MTRs at LRIC+, higher value customers (who tended to make significantly more M2M calls than they received) would be more expensive to serve for an MCP with a small share of subscribers, relative to an MCP with a large share of subscribers.[261] The smaller gap between LRIC and LRIC+ in the current review compared to the previous review means that we might expect the effect to be less going forward. Calling patterns may have also changed such that M2M call ratios may not be as divergent as previously thought, although the data we have on this is incomplete so it is difficult to generalise.[262]

6.118 Under MTRs set at LRIC there would be no variation in the profitability of particular customer types depending on the MCP's market share. We consider that such competitive neutrality is desirable, because it provides a level playing field for each MCP to compete for each customer type, regardless of whether that customer is a net maker or net receiver of M2M calls. On the basis of this feature of the customer segment effect alone, we consider that LRIC is the appropriate cost standard.

6.119 The argument against LRIC+ (and in favour of LRIC) would be strengthened if the subset of customers for whom MCPs with a low market share are at a disadvantage under LRIC+ MTRs (i.e. net makers of M2M calls), were a particularly valuable group that made large numbers of M2M calls. In that case, the customer segment effect could harm the opportunities for MCPs with smaller market shares to grow their revenue, and cover fixed and common costs.

6.120 In the previous market review (and up until the 2012 CC Determination), it was considered that, overall, post-pay customers (especially high-use customers) tended

[260] When considering the market share induced competition effects between MCPs, the relevant call balance is M2M outbound and inbound traffic, including both on-net and off-net calls. It is this ratio for a given subscriber which is directly affected by the serving MCP's market share. The inclusion of fixed or international inbound traffic merely moderates the market share effect – i.e. the expected quantity of inbound calls from fixed or international destinations callers to the subscriber in question is unaffected by the serving MCPs' market share.

[261] See Table A3.2, Figure A3.5-A3.6 and Table A3.3 of the 2011 MCT Statement.

[262] [✂] was unable to provide the data requested by Ofcom and none of the other MCPs provided complete data that would allow calculation of the relevant ratio for the analysis of customer segments (i.e. the ratio of outbound to inbound M2M calls). The most complete data was provided by [✂] but would have required the imposition of further crude assumptions to arrive at an estimate of the relevant ratio. In addition, the MCP in question accounts for only [✂] of subscriptions. It is therefore difficult to make robust generalisations about M2M call ratios for customer segments.

to be roughly balanced or net makers of M2M calls, so MCPs with a lower market share were at a competitive disadvantage in this segment under LRIC+ MTRs.[263] Post-pay customers were also considered likely to attract higher revenues and profits than pre-pay customers on average.

6.121 In their response to the consultation, EE and Vodafone argued that there was no evidence that high use post-pay customers are particularly likely to be net makers of M2M calls and so no evidence to conclude that the customer segments effect on competition exists. EE said that evidence from Kantar and GFK surveys in 2014 suggests that 71% of all post-pay subscribers in the UK retail mobile market are migrations from pre-pay and that, given pre-pay customers are net receivers of calls, this further calls into question whether post-pay customers are still net makers of M2M calls on average. EE further argued that, if post-pay customers have reasonably balanced traffic and pre-pay customers are net receivers of calls, then under LRIC+ smaller MCPs would no longer be at a disadvantage in the post-pay market and would have an advantage in pre-pay, but LRIC would be to their disadvantage.

6.122 However, since by definition M2M calls made must equal M2M calls received across the market, if pre-pay are net receivers of M2M calls, then post-pay must be net makers. Even if as a whole post-pay are close to balanced (i.e. a M2M call ratio of around 1), it seems unlikely that this would be the case for all customer segments within post-pay. For example, those migrating from pre-pay (where it seems the M2M call ratio is more likely to be below 1) would seem more likely to migrate to lower-end post-pay tariffs than upper-end post-pay tariffs.

6.123 We requested further information from MCPs following our June 2014 Consultation. However, the data provided is limited and it is difficult to generalise for the relevant traffic of interest in the analysis of competition for customer segments, i.e. M2M call ratios. However, looking at MTR-affected call ratios, it seems from the subset of MCPs that were able to provide information, that among post-pay customers, call balances for MTR affected calls are higher for customers with higher monthly expenditure.[264]

6.124 As a further indication of the potential competition effects for different customer segments, we note that H3G commented that lower MTRs greatly enabled it to compete for higher-value customers such as those wanting a smartphone plus large or unlimited bundles of minutes, data and texts. It stated that being able to compete in this segment is essential to being a credible and viable vertically-integrated MCP.

---

[263] 2012 CC Determination, paragraphs 2.34 and 2.625. Note that the CC considered the ratio of calls involving MCT: so it included off-net MTM calls, FTM calls and 'other to mobile' calls, but did not include on-net MTM, MTF or 'mobile to other' calls. See paragraph 2.27 of the 2012 CC Determination.

[264] As can be seen in Annex 5, Fig A5.4, the MTR-affected call ratio increases across the first 3 post-pay spend segments (i.e. monthly expenditure of £0-£19.99, £20-£29.99, £30-£40). Above £40 monthly spend, the ratio declines slightly. Note that the call ratios presented in Annex 5 relate to MTR-affected calls (i.e. the ratio of off-net calls to mobiles divided by the sum of termination traffic for which an MTR is billed, i.e. inbound traffic from off-net; fixed to mobile; and international to mobile calls). This will differ from the M2M call ratio which is given by the sum of outbound to on-net and off-net divided by the sum of inbound from on-net and inbound from off-net calls. The M2M call ratio will tend to be larger than the MTR-affected call ratio when terminating traffic from non-mobiles is large and when the on-net outbound to inbound call ratio is the same (or similar) to the off-net outbound to inbound call ratio.

6.125 One MCP provided information which supports the view that a customer's net MTR balance affects competition, particularly when attempting to retain customers. It noted that traffic balances can be extracted for individual records (but not in aggregate) from its Customer Relationship Management systems at the point a customer seeks an upgrade. Sales representatives can then retrieve the customer's individual details, including whether the customer generates a net MTR payment or cost over previous months. This MCP suggested that this provides information on how much discount could be offered to that individual customer consistent with the customer remaining profitable over the customer lifetime.

6.126 Moreover, because new entrant MCPs and MCPs with fewer subscribers will not have information on as many customers (since by definition more customers are with larger MCPs), they may be at a disadvantage compared to MCPs with more subscribers in tailoring tariffs to appeal to customers with different calling patterns.

6.127 For these reasons, we consider that MTRs above LRIC are undesirable because they distort competition across MCPs for customer segments which are net makers or net receivers of M2M calls.

Retail effects arising from on-net/off-net differentials

6.128 MTRs which are above LRIC may encourage MCPs to price on-net and off-net calls differently, since MTRs above LRIC cause an MCP's perceived incremental costs to differ across on-net and off-net calls. The higher the MTR, the higher this differential would be expected to be.

6.129 On-net/off-net price differentials could make MCPs with a lower market share less attractive to consumers as a greater proportion of calls from an MCP with a lower market share will go off-net. Thus even if two MCPs have identical tariffs, a consumer could lower his expected spend for a given volume of outbound calls by choosing the MCP with the higher market share. We labelled this "retail effects" in the 2011 MCT Statement.

6.130 Telefonica said there is no convincing evidence that this effect exists. For this to be the case, Telefonica argues, Ofcom must show that 1) MTRs above LRIC lead to a greater prevalence of on-net/off-net retail price differentials; and 2) that such differentials put smaller MCPs at disadvantage. On the first point, it argued Ofcom had not shown that, since the last review, the extent of on-net/off-net retail price differentials had reduced and that this was due to lower MTRs. On the second point, it suggested that smaller MCPs may actually benefit from such differentials and use them as a marketing tool, and said that this would be consistent with its view that smaller MCPs tend to be the ones offering lower on-net retail prices. EE also said that although some smaller players offer such differentials, it would be wrong to conclude that it has a material effect on competition. Vodafone said that Ofcom appears to be lukewarm at best in its analysis of retail effects.

6.131 H3G said that on-net/off-net pricing differentials have now largely disappeared from the UK mobile market, with all MCPs tending to offer large bundles of any-network voice minutes as standard. It thought this was evident in the significant growth in outgoing off-net M2M calls and the decline in on-net M2M calls. It considers this chiefly reflects the competitive impact of lower MTRs.

6.132 We believe that on-net/off-net differentials are likely to be affected by MTRs, but recognise that the presence (or absence) of on-net/off-net differentials could also be affected by other factors. The importance of the MTR in on-net off-net differentials

seems to be corroborated by empirical evidence suggesting a decline in on-net/off-net differentials as MTRs have fallen. For example, in 2006, when regulated MTRs were around 6ppm (in nominal terms), the average retail price was 3.5ppm for an on-net call compared to 8.9ppm for an off-net call. In 2002, when regulated MTRs were around 10ppm (in nominal prices), retail prices were 5.1ppm on-net and 22.6ppm off-net.[265] Data available more recently does not allow us to assess average on-net/off-net differentials, which appear to have become less prevalent.

6.133 It therefore seems possible that if MTRs were set significantly above LRIC, on-net off-net retail price differentials could become more prevalent. However, because the gap between LRIC and LRIC+ is now small, the choice of cost standard may have more limited effects on retail on-net and off-net call differentials, than was the case in past reviews.

Evidence of increased competition between MCPs

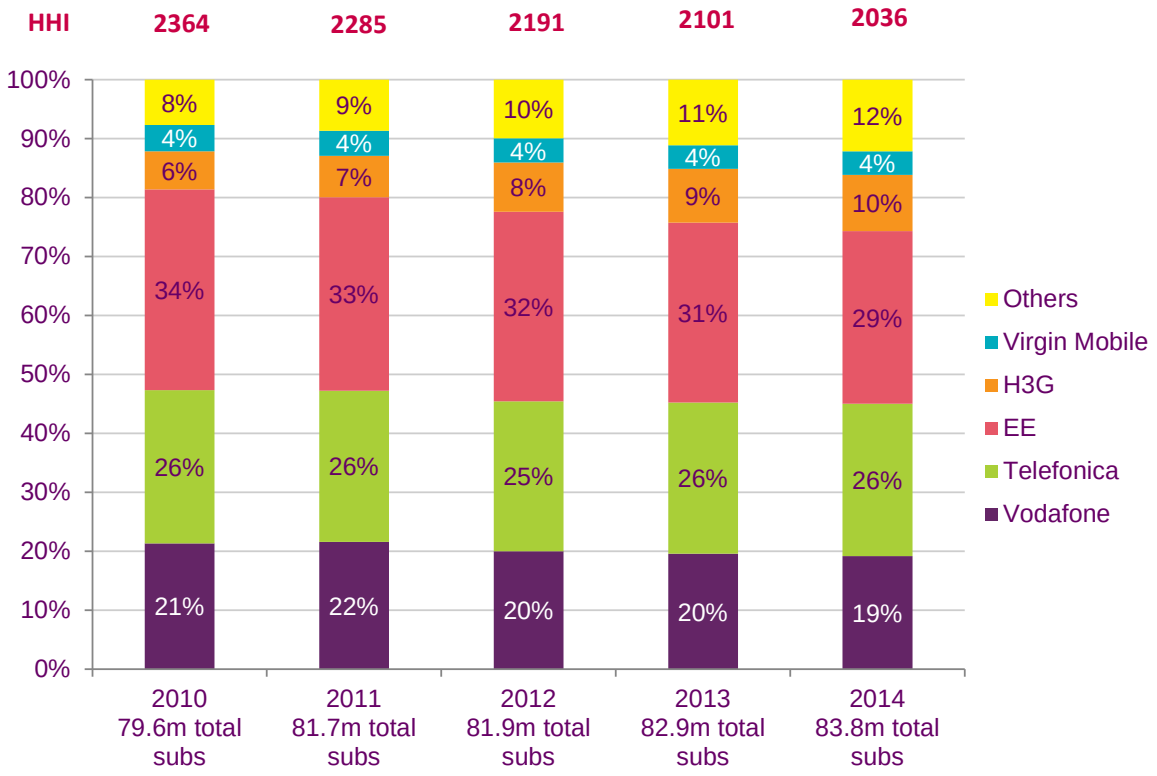
6.134 In our June 2014 Consultation, we argued that recent market developments suggested that competition had increased over the time period during which MTRs declined. We supported this with evidence that the market share of H3G and other small MCPs had grown.

6.135 Between 2010, when a LRIC+ standard was in place, and 2014, the combined market share of the largest three operators (EE, Telefonica and Vodafone) fell from 81% to 74%. They lost market share both to H3G, which gained three percentage points of market share in the same period, and to MCPs outside the top five. The overall reduction in concentration in the market is shown by the reduction in the Herfindahl-Hirschman Index (HHI) which decreased by 328 points from 2364 to 2036.[266]

[265] Figure 4.40 in Ofcom, *The Communications Market 2007*, '4 Telecommunications', 23 August 2007. http://stakeholders.ofcom.org.uk/binaries/research/cmr/telecoms1.pdf

[266] HHI is an indicator of the amount of concentration (i.e. lack of distinct competitors) in a market. It can range from close to 0 (i.e. the market is very competitive) to 10000 (i.e. monopoly). The HHI is calculated by summing the square of the market shares for each MCP.

Figure 10: Evolution of market shares



Source: Ofcom/operators, data sampled at the end of Q2. Figures may not sum to 100% because of rounding.

6.136 Telefonica, Vodafone and EE all questioned Ofcom's interpretation of H3G's growth, arguing that it was not related to MTR levels.

6.137 Vodafone argued that historical data it holds shows that H3G's largest annual growth occurred in 2008/09 when MTRs were at 5.75p and that in the twelve months to June 2014 (a period when MTRs have been at their lowest), H3G reported a 1% decline in registered customers. Looking forward, Vodafone argued that if H3G can grow so successfully with high MTRs, then MTRs at 0.8ppm+/-0.3p cannot be material to H3G's growth.

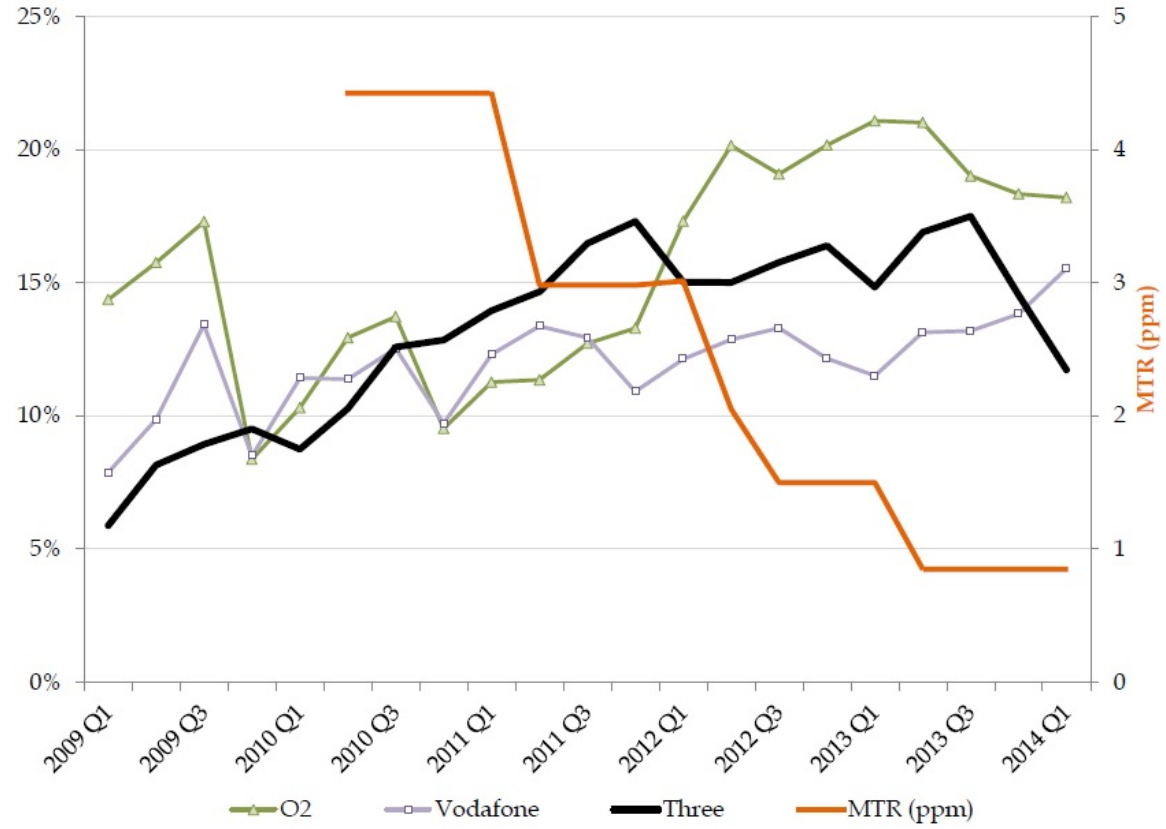
6.138 Telefonica argued that from 2012 to 2014 there was no improvement in H3G's share of gross post-pay additions, even though this was the time period when the largest MTR reductions occurred. Telefonica said that if Ofcom's theoretical analysis that smaller operators would be at competitive disadvantage under LRIC+ in the segment of customers that are net makers of calls (post-pay in general) held true, we would expect H3G's share of gross post-pay additions to improve further in 2012-2014 as further MTR reductions took MTRs closer to LRIC during that period. Data provided by Telefonica showed that H3G's share of post-pay additions 'did not show any improvement in 2012, 2013 or 2014 and was even comparatively lower from April 2013 to April 2014 (see Figure 11 below).

6.139 Telefonica also argued that H3G did not do well in the pre-pay segment even when MTRs were above LRIC (where it was supposed to get an advantage according to Ofcom's theory) but noted that this could have been due to H3G's own commercial

decisions. Telefonica said this is illustrated by Figure 12 below which shows that H3G's performance is "very weak compared to other players in the market".

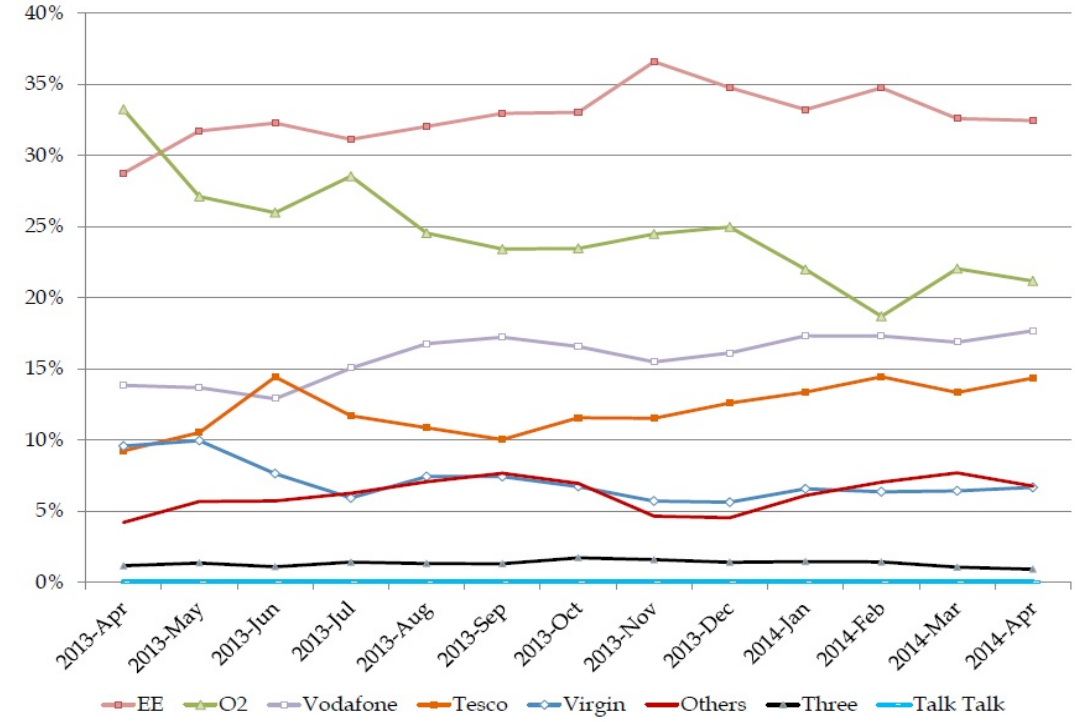
6.140 EE also pointed out that H3G's share of net contract additions has been falling despite MTRs being brought down to LRIC.

Figure 11: MTRs and MCP share of new additions, post-pay customers, Q1 2009-Q1 2014



Source: GfK data, AlixPartners Analysis

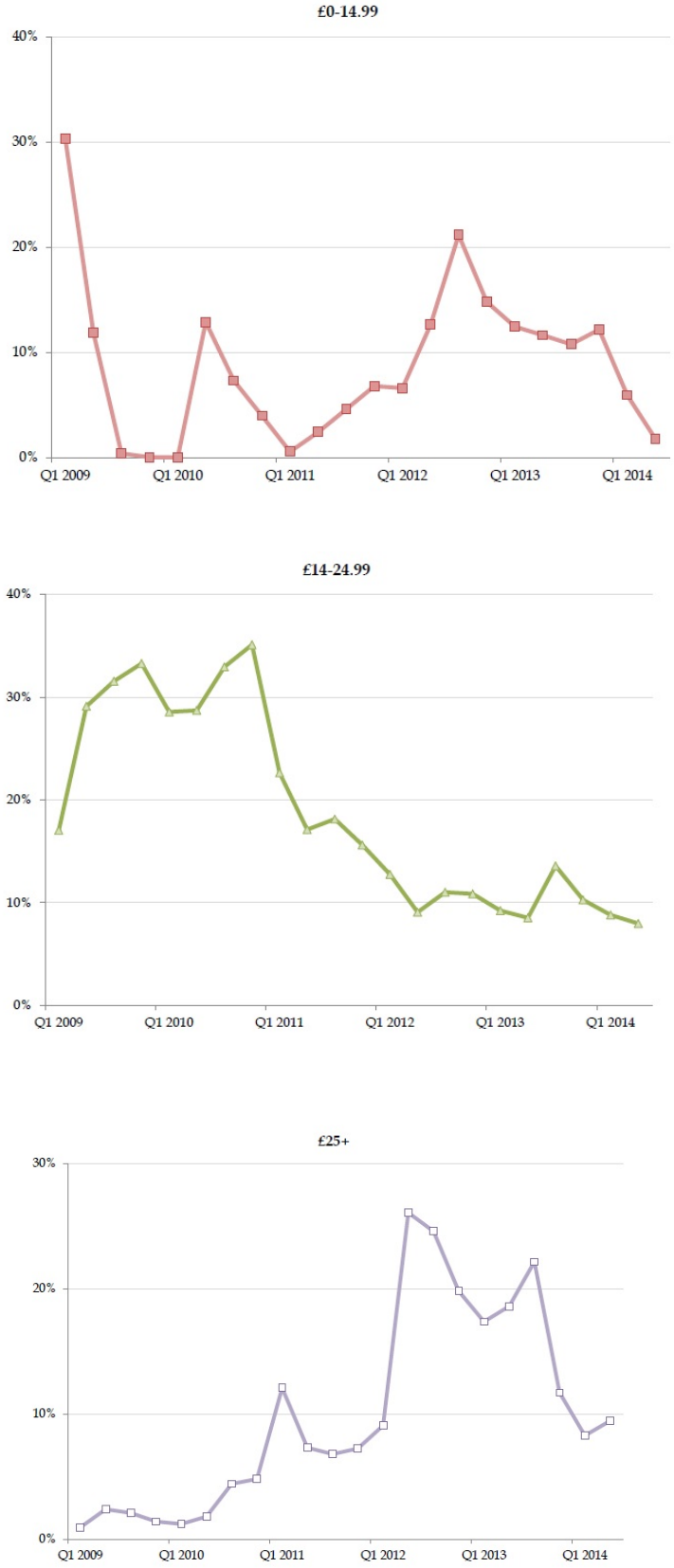
Figure 12: Pre-pay Handsets – share of gross additions for MCPs over the period April 2013 to April 2014



Source: GfK data, AlixPartners Analysis

6.141 Telefonica further argued that high MTRs had not hampered H3G's ability to grow, as shown by its high share of additions in the £14-24.99 post-pay segment between Q4 2010 and Q1 2012, when MTRs were still above LRIC. However, Telefonica also noted that H3G's share of net additions for contracts over £25 a month was higher in the time period when MTRs were at or on a path towards LRIC (see Figure 13 below).

Figure 13: H3G's share of new additions, post-pay handset contracts, by contract size



Source: GfK data, AlixPartners Analysis.

6.142 Telefonica believed that H3G's overall growth was due to reasons other than MTR reductions, such as gaining the iPhone (after O2's period of exclusivity), improved network-sharing with Orange and T-Mobile, and attractive post-pay tariffs launched in 2010. EE also pointed to an Enders Analysis report which attributes H3G's growth in market share to the launch of the One Plan at the end of 2010, and EE notes that Enders Analysis suggests that H3G is now reducing its emphasis on attractively priced unlimited data (which it considers was unsustainable). Vodafone added that Ofcom has not attempted to isolate the growth in H3G's post-pay segment from the general migration from pre-pay to post-pay.

6.143 However, H3G believes the One Plan to be the main driver of its market share increase during the period 2010 to 2013. Moreover, it states that its anticipation of the reduction in MTRs towards LRIC allowed it to launch the One Plan, which included much larger bundles of off-net voice minutes. It believes that it was progressively copied by all other major MCPs. It stated that its high growth after launch was related to the fact that its MTR was initially unregulated and then subsequently regulated at a higher level than the larger MCPs, allowing it to offer large bundles of voice minutes. Its MTR was then progressively reduced in line with the cap on the larger MCPs, especially during the period 2007 to 2011, and H3G submitted that this was a major contributor to the stalling of its market share growth during this period.

6.144 We also note that since MTRs have reduced, H3G appears to have had particular success in competing in the post pay segment, and in particular, in the high-value post pay segment, consistent with the 'competition for different customer segments' effects discussed above. The data provided by Telefonica shows that H3G's share of gross new additions in the post-pay segment has been similar to its rivals in most quarters since 2010, while before 2010 it lagged behind (see Figure 11, earlier).

6.145 We disagree with Telefonica and Vodafone's suggestion that MTRs have little to do with H3G's gain in market share for the following reasons:

6.145.1 First, both Telefonica and Vodafone appear to suggest that commercial retail decisions affected by MTR movements will always occur at the same time as, or later than, the MTR movements themselves. We consider it likely that an MCP's pricing decision would also be forward-looking (particularly for post-pay contracts which are often for up to two years), such that retail price changes may occur before regulatory changes come into force. We believe that the One Plan was only likely to be commercially viable at the MTRs proposed at that time (which were on a glide path to LRIC) and so H3G was unlikely to have launched this without a significant prospect of MTRs converging to LRIC. We also consider that H3G's pricing appears to have led to competitive responses from other MCPs. For example, in its response to our June 2014 Consultation, EE said that it decreased the retail price of some its top-end and mid-range SIM only tariffs in response to H3G's tariffs offers – these responses would tend to dampen H3G's growth in the later periods.

6.145.2 Second, we disagree with Vodafone that because H3G's largest annual growth occurred in 2008/09 when MTRs were at 5.75p.[267] Our view is that the reduction in MTRs over time has had an impact on competition.

[267] 6.57ppm in 2012/13 prices.

Vodafone's view does not take into account the fact that at that time H3G's MTRs were higher than the regulated MTRs of the three other national MCPs. This asymmetry of MTRs in H3G's favour would have offset (at least directionally) the asymmetry in MTR-affected call volumes against H3G. We agree with H3G that the resulting MTR margins earned at the time are likely to have contributed to its growth in 2008/09.

6.146 Our view is not that the growth in H3G's market share was the sole result of MTRs being reduced to LRIC. Rather, we consider that this development was consistent with MTRs converging to LRIC, and we recognise that MTRs are not the only driver of retail pricing and an MCP's growth.

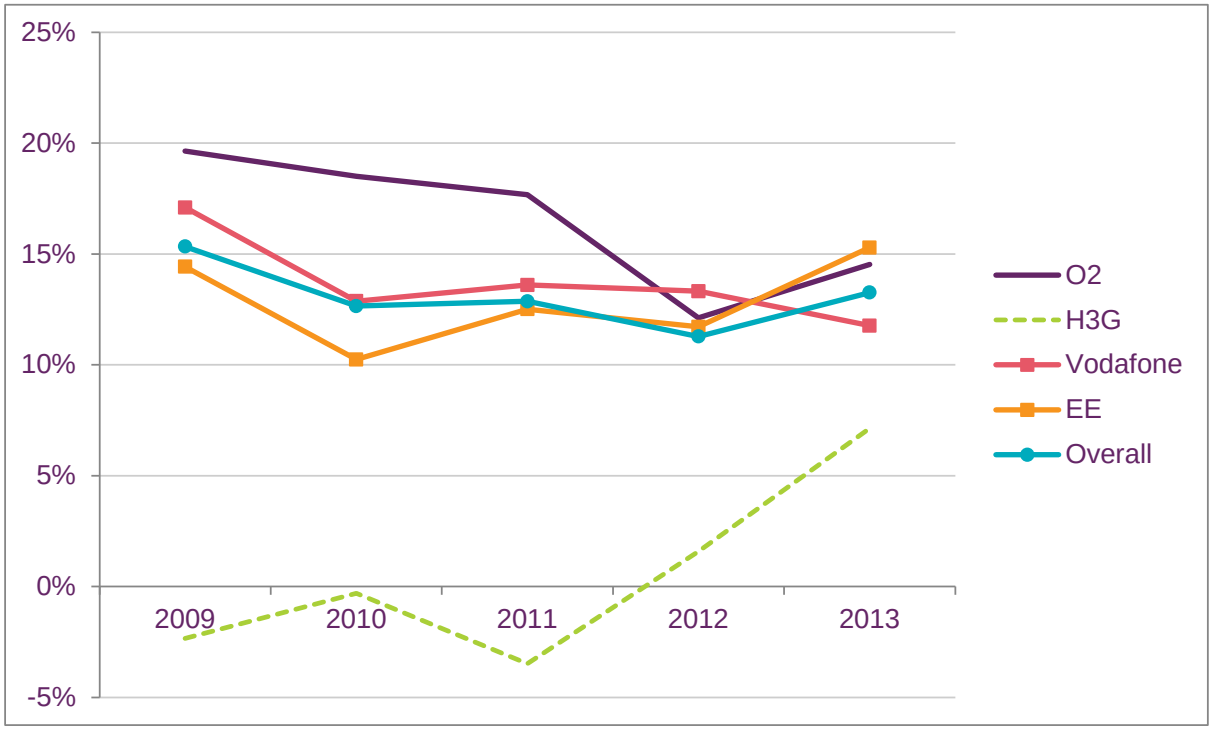
6.147 EE argued that intervention that favours one competitor cannot be equated with increased competition. We recognised in the June 2014 Consultation that the evidence we presented for H3G was just for one of the MCPs with a lower market share. However, while there has been entry at the retail level by various MCPs operating under wholesale agreements with larger MCPs (i.e. via MVNO business models), the extent of "full infrastructure" entry by MCPs is more limited. H3G is the most notable entrant using a national radio network in recent years, although H3G has been present for more than a decade.[268] Because there are economies of scale and scope in the mobile market, particularly at the wholesale network-level, we wish to minimise barriers to entry and expansion where possible. Therefore, it is appropriate to consider the performance of specific entrants (of which H3G is a pertinent example) unless we are to rely on theoretical arguments alone.

6.148 There is also other evidence which is consistent with increased competition. For example, in Annex 5 we discuss how a range of evidence suggests that, overall, retail mobile prices have decreased since the last market review, despite reductions in the contribution to common costs from MTRs. This retail price reduction was particularly marked in the post-pay segment, where customers were considered to be net makers of calls at the time of the previous review and net payers of MTRs. Therefore, these tariffs are more likely to decrease in price in response to a decrease in MTRs. However, even in segments that are net receivers of calls (which was primarily pre-pay where, all else being equal, we might expect a reduction in MTRs to increase retail prices, the prices of some MCPs have remained low; although we recognise that other MCPs (EE, Vodafone and Virgin Media) have increased retail prices for pre-pay users with low usage.

6.149 In considering the importance of smaller or entrant MCPs achieving scale, it is also helpful to consider the profitability of the four largest MCPs. As can be seen (in Figure 14 below), in aggregate, EBITDA less capex margins have remained relatively stable in the past five years. However, as shown, H3G has experienced a marked increase in its EBITDA less capex margin. This is likely to have been driven in large part by its growing market share, including in the high value post-pay customer segment. EE's margin has also increased, but as Vodafone notes, this is likely to be due to EE's growth in scale through its formation from the 2010 merger between Orange and T-Mobile. Vodafone also acknowledges that H3G's rising margin is as a result of its increasing scale. We believe that removing barriers to expansion which are likely to stem, amongst other things, from MTRs above LRIC, is likely to have contributed to H3G's growth.

[268] We note BT's recent acquisition of 2.6 GHz spectrum in the 2013 auction – although it has since favoured growth by acquisition rather than growing its own infrastructure and subscriber base.

Figure 14: Profitability of largest four MCPs, EBITDA- capex margin



Source: Ofcom, based on Company financial reports, based on capex excluding spectrum fees (H3G did not publish UK reports before 2010). Vodafone 2013 figure adjusted to exclude estimated impact of C&W. Vodafone figures relate to the year ending March 31st following the year shown.

6.150 Vodafone said that we did not take into account the fact that MTRs would also have fallen significantly even if a LRIC+ standard had been used, and that Ofcom had not found any significant impact from the decrease in MTRs from 2.01ppm (the LRIC+ figure submitted by Ofcom to the CC in 2012) to 0.845ppm (the current LRIC MTR). We recognise that the current choice between LRIC and LRIC+ (with a gap of around 0.4ppm in 2015/16) is likely to have a smaller effect on competition than either the drop in MTRs from 2010/11 to 2013/14 (of nearly 4ppm) or the difference between the levels of LRIC and LRIC+ modelled in 2011 (of around 1ppm for 2014/15).[269] Nevertheless, we expect MTRs at LRIC to continue to facilitate more effective competition between MCPs than MTRs above LRIC.

6.151 In summary, over the past three years during which MTRs have been reduced to LRIC, there have been changes in the retail market which we consider are consistent with increasing competition for subscribers.

Competition between MCPs and FCPs

6.152 We believe that there is some competition between MCPs and FCPs. MCPs and FCPs may, to a degree, compete for subscribers. However, the proportion of UK households that have both a fixed line and a mobile phone is 79%,[270] suggesting that competition between MCPs and FCPs for subscribers would potentially apply to a limited base.

[269] All in 2012/13 prices.
[270] Ofcom, *The Consumer Experience of 2014,* Research document, published 28 January 2015, figure 37. http://stakeholders.ofcom.org.uk/binaries/research/consumer-experience/tce-14/TCE14_research_report.pdf

6.153 However, there is more significant scope for MCPs and FCPs to compete for calls. Customers with both a fixed line and a mobile phone may have a portion of calls they can switch between these devices; we have noted in other Ofcom publications the declining trend in fixed call origination and the likely substitution to mobile call origination.[271]

6.154 In its response to the June 2014 Consultation, BT emphasised that it felt that as a matter of technology neutrality it is important to ensure regulatory consistency between fixed and mobile termination rate regulation, both of which are now using LRIC, and that it was important to ensure the minimum possible distortions between fixed and mobile technologies. It believes this is likely to become increasingly important during this review period to the extent there is commercial or technological convergence between the fixed and mobile sectors. [✂] also stated that LRIC+ risked creating a competitive distortion between the mobile and fixed sectors at a time when convergence is a growing reality.

6.155 Telefonica suggested that FCPs have managed to retain the majority of the reduction in MTRs, suggesting that they are not subject to a competitive constraint from customer switching to mobile calls.

6.156 Vodafone said that the choice of LRIC+ rather than LRIC, would not prevent FCPs from recovering their cost of providing fixed to mobile calls. In support of this point, Vodafone submitted that fixed to mobile calls are currently priced significantly above cost.

6.157 As discussed in Annex 5, we consider the pass through by FCPs to be significant, although not complete. Therefore, we disagree that evidence on pass-through suggests competition between fixed and mobile calls is limited.

6.158 We acknowledge that competition between FCPs and MCPs in calls is not as intense as it is among MCPs. We also do not claim that the distortion of competition between FCPs and MCPs is the most significant detriment from MTRs above LRIC. However, we still believe that it is a relevant consideration.[272] MTRs set above LRIC could distort the competition that does exist between MCPs and FCPs. FTRs are now set at LRIC, so MTRs above LRIC would mean that FCPs are contributing to the common costs of MCPs, but MCPs are not contributing to the common costs of FCPs. Thus FCPs would have to recover the common costs of their networks from their own subscribers, including potentially from outbound calls, thereby making call origination from fixed lines less attractive than call origination from a mobile.

6.159 We therefore consider that MTRs above LRIC would be likely to affect competition between FCPs and MCPs, and that it is important to maintain regulatory consistency in the cost standards used for FTRs and MTRs (with FTRs at LRIC since early 2014).

---

[271] Between 2007 and 2013, the volume of mobile calls increased by 28%, while fixed-line calls steadily decreased year on year, decreasing by approximately 38% over that period. We also expect this trend to continue in the future. See 2013 FNMR Statement.

[272] We note that the CC in its 2012 CC Determination held the view that it is 'incorrect to suggest that a conclusion that mobile and fixed networks comprise separate economic markets implies a degree of competitive interaction between the providers of fixed and mobile network services that is so limited that we would not be concerned about the impact of the cost standard adopted on this competition.' (paragraph 2.491) We agree with this view.

Overall conclusions on competition effects

6.160 We consider that setting the MTR cap at LRIC, rather than LRIC+ (or any other cost standard that would result in a cap above LRIC), is more likely to encourage effective competition.

6.161 EE, Vodafone and Telefonica do not believe this effect is significant. We accept that the choice between LRIC and LRIC+ may have a lower impact on competition now than in 2011 given the reduced differential between the two cost standards. Nonetheless, we consider that there is scope for a material effect.

6.162 EE and Vodafone suggested that the marginal benefit from increasing competition is limited given that the retail-side of the UK mobile market has been found to be effectively competitive. However, we believe it is important to maintain this competition, and that we should regulate the key wholesale market of access to termination on other networks in such a way as to facilitate effective retail competition. Given the importance of competition in producing efficient outcomes, we put significant weight on this.

Distributional effects on vulnerable consumers

Introduction

6.163 In identifying the appropriate cost standard for the charge control, our key focus is to address consumer harm associated with the market failure arising from SMP. In the 2011 MCT review it was argued that any decision to set MTRs at LRIC may particularly affect vulnerable consumers who may be subject to price increases.

6.164 In this review, we have considered those on low incomes (below £11,500 per year) and/or in lower socio-economic groups (D and E) to be the most vulnerable as they can least afford an increase in price. We refer to such consumers below as 'vulnerable consumers'.[273]

6.165 In the June 2014 Consultation, we said there was nothing in the empirical evidence we considered which suggested that market outcomes have been significantly worse for vulnerable consumers under LRIC compared to the outcomes observed under LRIC+ MTRs.

6.166 BT, H3G, [✂], Verizon and Virgin Media agreed with our analysis. BT said that the lack of negative impact on vulnerable consumers was partly due to enhanced competition and a vibrant MVNO sector which ensures that a range of competitive tariffs is available across all sectors. Verizon said that the fact that our data showed increased levels of mobile ownership since the last review, with growth within the vulnerable consumer segment being even greater than in the overall population, was a positive indicator.

---

[273] Ofcom usually considers the 'low income group' to be those with 70% of the median household income before housing costs, adjusted for the size of household, using the Organisation for Economic Co-operation and Development (OECD) equivalence scales, and reporting that they can't afford to do at least one activity on a list of typical activities. However, for practical reasons related to data collection on mobile characteristics for this 'low income group' and consistency in comparing data from different years, we continue, as in 2011, to consider the group of consumers with an income under £11.5k.

6.167 EE, Telefonica and Vodafone disagreed with our analysis of the impact on vulnerable consumers. They argued that the impact of LRIC MTRs on pre-pay customers has been significant and that low usage pre-pay customers (whom they consider to be more likely to be vulnerable consumers) have been most affected. Telefonica and Vodafone said that distributional considerations meant that there was an asymmetric risk in that, should Ofcom set MTRs below LRIC because of modelling errors, there could be further negative impacts on vulnerable consumers.

6.168 The characteristics of these consumers, in terms of their usage of mobile and fixed line services, as compared to the overall UK population, are shown in Table 12 below.

Table 12: Mobile characteristics of particular consumer segments

	Income under £11.5k		DE segment		Overall UK population	
	2011	2014	2011	2014	2011	2014
Do not use a mobile phone[274]	21%	17%	16%	12%	9%	7%
Post-pay	29%	43%	30%	48%	49%	65%
Pre-pay	71%	56%	69%	52%	50%	34%
Signed for sim+handset in current contract	82%	84%	81%	83%	86%	86%
Signed for sim-only in current contract	16%	16%	14%	15%	11%	12%
Use a smartphone (from those who use a mobile)	17%	51%	21%	55%	30%	68%
Are likely to get a smartphone in next 12 months (those without) †	8%	11%	9%	15%	14%	16%
Lives in a fixed-only household	15%	13%	11%	8%	6%	5%
Lives in a mobile-only household[275]	29%	34%	25%	26%	15%	16%

Source: Ofcom Technology Trackers, Q1/2011 (except '†' where Q2/2011 has been used) and Q2/2014. The proportion of 'fixed-only' and 'mobile-only' households in 2011 and 2014 are from bespoke analysis on the Q1/2011 and Q2/2014 Technology Tracker respectively and are not included in the public versions but, for 2014, the figures for the 'overall UK population' (5% and 16% respectively) can be found in Figure 38 of the January 2015 Consumer Experience Report.[276]

[274] This is the proportion of UK adults who do not *personally* use a phone. In the June 2014 Consultation, we presented figures showing the proportion of adults who had no mobile usage in their *household*. We consider however the proportion of adults who do not *personally* use a mobile phone to be more relevant for the present analysis because it corresponds to mobile ownership. We note that, for each of the three segments (under £11.5K, DE and overall UK), the difference in percentage points between the 2011 and 2014 figures is the same whether we chose mobile ownership per household or at individual level.

[275] In the 2014 FAMR Statement, Ofcom revised the proportion of consumers who live in a mobile-only household to exclude households that have a fixed line which is used only for broadband purposes. The updated estimates reduced the proportion of mobile-only households to 11%. See A24.75 to A24.80 of Annex 24 of Ofcom, *Fixed access market reviews: wholesale local access, wholesale fixed analogue exchange lines, ISDN2 and ISDN30 – Annexes, Statement, 26 June 2014*. http://stakeholders.ofcom.org.uk/binaries/telecoms/ga/fixed-access-market-reviews-2014/statement-june-2014/annexes.pdf However, we have kept the 16% figure to ensure that the disaggregated figures (for consumers under £11.5k income and DE category) are consistent with the total from the same survey. The 16% figure is also perhaps more consistent for our purposes since households that have a fixed line only for broadband will be unable to make calls to mobiles from their own fixed line.

[276] Ofcom, *The Consumer Experience of 2014*, Research document, 28 January 2015. http://stakeholders.ofcom.org.uk/binaries/research/consumer-experience/tce-14/TCE14_research_report.pdf

Mobile only consumers

6.169 Our main potential concerns are in relation to vulnerable consumers who only have a mobile phone and no fixed line. This is because the detriment to these consumers, in the unlikely event that MTRs at LRIC caused them to give up their phone (due to other retail mobile prices increasing), is likely to be significantly higher if they lose their only way of communicating than if they also had a fixed line which they could use as an alternative.

6.170 Vulnerable consumers are more likely to be net receivers of calls. Over 50% of vulnerable consumers are still pre-pay customers who are typically net receivers of MTR-affected calls (see Figure A5.1 and A5.3 of Annex 5[277]). This is higher than the UK average of 34% pre-pay (according to the 2014 Ofcom Technology Tracker). This proportion of pre-pay subscribers has decreased significantly in line with the general trend as subscribers migrate to post-pay. However, it is possible that, despite moving to post-pay contracts, certain vulnerable consumers remain net receivers of MTR-affected calls (see Figure A5.2 and A5.4 in Annex 5 which show, among other things, that post-pay customers with an average monthly spend below £20 per month are typically net receivers of these calls).

6.171 As net revenue from MTRs is lower as MTRs are reduced to LRIC, MCPs may in theory increase retail prices to compensate for this revenue loss. However, we consider that vulnerable consumers are unlikely to be significantly worse off with LRIC MTRs relative to LRIC+ (or any other cost standard above LRIC).[278]

6.172 This is consistent with market evidence following the move to LRIC since 2011, which gave rise to a much more significant reduction in MTRs than the now projected difference between LRIC and LRIC+. The basic pre-pay charges for some MCPs (e.g. Vodafone, EE, Virgin Media) may have increased, however, a large number of MCPs (including O2, H3G, Tesco Mobile, Giffgaff and Lebara)[279] which together cover about half the pre-pay market, have maintained or even reduced their pre-pay prices.[280] The January 2015 Consumer Experience Report[281] shows that SIM-only tariffs were available in 2014 from as little as £5 a month. This suggests that there are still affordable alternatives available for a vulnerable consumer. As such, it is unlikely that any significant affordability issues will have occurred from the move to cap MTRs at LRIC.

6.173 The lack of apparent affordability issues is corroborated by the fact that mobile ownership levels in the population have increased since the last market review, from 91% to 93% (see first row of Table 12 above and Figure A5.28 in Annex 5).

---

[277] There we show that the outbound to inbound ratio of MTR-affected calls is typically less than 1 for those MCPs from whom we had useable data, although there was wide variability between the MCPs (between around [✂] and [✂]).

[278] This is in line with the CC view in the 2012 CC Determination where it said that, while it identified some negative effects on mobile usage and potentially affordability (in line with its views on the expected impacts on low-use customers), it considered these were unlikely to be material. See paragraphs 2.918-919.

[279] Lebara increased its off-net pre-pay charges from 10 to 16ppm but decreased its on-net pre-pay charges from 15 to 0ppm.

[280] See Annex 5, paragraphs A5.65 to A5.76 and figures A5.18 to A5.23.

[281] See page 143, Ofcom, *The Consumer Experience of 2014*, Research document, 28 January 2015. http://stakeholders.ofcom.org.uk/binaries/research/consumer-experience/tce-14/TCE14_research_report.pdf

6.174 More importantly, as shown in Table 12: above, ownership levels within the vulnerable consumer segment increased by 4 percentage points (from 79% in 2011 in the segment with income under £11.5k and from 84% in the DE segment).[282] Moreover, this growth is proportionately higher than that seen in the UK overall where ownership increased by 2 percentage points, up from 91% in 2011 (i.e. mobile ownership grew around 5% in relative terms under either proxy measure of vulnerable consumers, but grew only a little over 2% among the population as a whole). [283] It is possible that growth in ownership could have been slightly higher under LRIC+, but we have no reason to believe the difference, if any, would have been significant.

6.175 Furthermore, as shown in Table 13 below, the prices of basic handsets have fallen since 2011 (most likely driven by falling costs), and this trend is likely to continue. Thus even if there were a rebalancing of prices from the termination to the retail side of the market (consistent with a waterbed effect, i.e. retail prices increasing as MTRs fall), this would be offset by a lower price for consumers of taking or renewing a basic mobile handset. Moreover, we note that any upward pressure on the overall mobile retail bill would also be mitigated as mobile network costs are projected to continue to decline.[284] This again suggests affordability is not likely to be a significant issue.

[282] The 79% and 84% figures correspond to 100% minus the percentage of consumers who 'do not use a mobile phone in Table 12:).
[283] The 5% ownership growth for vulnerable consumers is calculated as 4% / 79% and 4% / 84%. The 2% growth in the overall population is calculated as 2% / 91%.
[284] See Annex 8 (Section 4.5 of the Analysys Mason report) and Annex 12 (Figure A12.1).

Table 13: Example of basic handset prices

	2011	2014
Standalone price	Alcatel OT 209: £24.90 Samsung E1080: £29.90	Alcatel OT 1010X: £12.99 Samsung E1200: £15
Pre-pay price[285]	Tesco Nokia 1616: £11.97 T-Mobile LG GS101: £7.97 O2 Samsung E1080: £9.97	O2 Alcatel 1040: £4.99 EE Nokia 106: £4.99 Vodafone Samsung E1200: £0.99

Sources: For 2014 prices, Tesco Direct and Amazon for standalone phone prices and MCP websites or Carphone Warehouse for pre-pay prices, as of November 2014.[286] *For 2011 prices, Wayback machine as of October 2011. All phones are 2G feature phones, able to make calls and send/receive SMS, and, are marketed as 'entry-level' phones.*

6.176 Vodafone said that this analysis did not meaningfully address the extent to which incentives to serve vulnerable consumers who are typically unprofitable would be reduced following significant reductions in MTRs, nor whether the quality of service to such customers could be adversely affected. It also said that it did not address the effects on vulnerable prepay subscribers of the withdrawal of handset subsidies in the pre-pay market which occurred following the move to LRIC in 2011. It said MCPs could be forced to mitigate their position by adopting further measures (incremental to those already adopted) that could lead to harm for such subscribers.

6.177 We consider that the evidence above implies that MCPs have not stopped serving the vulnerable segment of the market. Some MCPs such as Telefonica have

[285] For 2014, the handset prices apply under the following conditions. The consumer appears to be only required to purchase a credit top-up when buying the phone (£10 generally) and there does not appear to be any requirement to commit to further top-ups or a monthly spend. The required top-up credit does not generally appear to have an expiration date, unless the consumer does not make a chargeable call in a long time, in which case the MCP might disconnect the SIM. However, consumers might get some 'free' allowance every time they make a top-up (e.g. free call minutes, SMS and/or data) which generally expires after a month. This allowance is additional to the consumers' top-up credit which they can use to purchase calls, SMS or data at the MCP's basic pre-pay charges. Consumers can also choose a 'package' which provides a given allowance for calls, SMS and/or data. It appears that, by doing so, the customer does not commit to a monthly spend but, rather, provides an 'authorisation' to the MCP to automatically 'invest' the customer's top-up credit into their chosen package and the customer can withdraw from the package and revert to 'basic' PAYG at any time. To qualify for some packages, customers might however need to top-up on a regular basis (generally monthly).

[286] We have obtained the O2 Alcatel 1040 and EE Nokia 106 pre-pay phone prices directly from O2's and EE's websites, looking at pay as you go phones. For both of these phones, a £10 credit top-up is required. We have also looked on the Carphone Warehouse website, which is where we found the Vodafone Samsung E1200 pre-pay phone price. For new Vodafone customers, a £20 credit top-up is required. For existing Vodafone customers, the Samsung E1200 can be obtained via Carphone Warehouse as a simple 'upgrade' for £0.99 without needing to top-up.

subsidiaries (Giffgaff and Tesco Mobile which is a joint venture with Tesco) serving pre-pay customers, with lower charges than O2's. Although the creation of these subsidiaries pre-dates our decision to set LRIC MTRs in 2011, their presence in the market today suggests a continued interest in pre-pay. While some pre-pay customers are perhaps less profitable than they were before, it is not clear they are unprofitable – especially once acquired. We consider that any call made or SMS sent by these customers would generate a positive margin.[287]

6.178 We recognise that some MCPs may choose not to seek to attract such consumers in the future. However, the ownership and price data does not suggest this is in any way a significant concern following the 2011 MCT Statement when MTRs were reduced to LRIC.

6.179 Regarding quality of service, we consider it unlikely that network quality would be lowered for particular segments of customers, especially for such a large segment such as pre-pay. It is also possible for MCPs to reduce other aspects of quality of service such as customer support for pre-pay. However, pre-pay still constitutes a significant part of the mobile market. The continued interest in this segment suggests that MCPs still find it in their interest to compete for pre-pay customers and therefore are unlikely to significantly alter customer service or quality in that segment. Furthermore, pre-pay customers are potential future post-pay customers (as evidenced by the migration from pre-pay to post-pay more generally) and might perceive a low quality of service as representative of their existing MCP's overall quality of service (including if the subscriber were to migrate to post-pay). Finally, there is no evidence of any significant change in the quality of pre-pay services offered following the move to LRIC in 2011 and we are not aware of any intention by MCPs to do so.

6.180 Regarding handset subsidies, MTRs at LRIC may lead to a reduction in the subsidies available to pre-pay customers. However, as suggested in the 2012 CC Determination, the level of handset subsidy for pre-pay customers was already low at the time of the previous market review, driven by successive MTR reductions and a desire to avoid 'box-breaking',[288] and they might have been driven to even lower levels or zero following the transition to MTRs at LRIC. As discussed above, this has not prevented ownership levels from increasing, especially among vulnerable consumers, suggesting that the lowering or removal of handset subsidies had little impact on this segment of customers.

6.181 Furthermore, as discussed above, basic SIM-free handsets are still available at affordable prices (i.e. on a standalone basis). This implies that even in the absence of handset subsidies, it is highly unlikely that vulnerable consumers would not be able to afford handsets.

6.182 In summary, while there has been an increase in basic pre-pay usage charges by certain MCPs following the move to LRIC in 2011, this is not universally the case and the retail price of a basic standalone handset is now very low. The smaller difference between the projected levels of LRIC and LRIC+ compared to at the time of the previous review is likely to result in an even smaller impact going forward. We

[287] This is consistent with the CC's view (see 2012 CC Determination, paragraph 2.749).
[288] 2012 CC Determination, paragraph 2.702. The CC defined 'box breaking' as "when someone buys a subsidised pre-pay handset but never activates it, instead selling it for a profit in the UK or overseas."

therefore do not consider that the choice of LRIC in this review period is likely to have any significant impact on more vulnerable mobile only consumers.

Fixed line consumers

6.183 In this section we consider whether there are any further impacts on vulnerable consumers with a fixed line.

6.184 If MTRs fall, we would expect this to be reflected in lower prices for F2M calls or the inclusion of these calls in bundles. This should benefit vulnerable consumers with a fixed line. In the June 2014 Consultation, we said that while the retail price of F2M calls has not come down as much as the reduction in MTRs, there has still been a significant degree of pass-through of the MTR reductions into retail prices overall (i.e. across business and residential customers).

6.185 As discussed in Annex 5, a number of stakeholders have commented on the level of pass-through. This has led us to carry out further analysis into the level of pass-through (see the Section 'Impact of the cost standard on fixed-to-mobile prices and usages' in Annex 5). This analysis shows that, between 2011 and 2012, MTR reductions appear to have been passed through to residential customers in the form of a retail price reduction (a 39% pass-through) but not in other years.[289]

6.186 BT claims that the most significant MTR reduction in 2011 was passed through in full to consumers in 2011 and that subsequent MTR reductions were passed to consumers in the form of not increasing the retail price of F2M calls. We note that the industry average price of other fixed line services such as UK geographic calls and line rentals have increased. For instance, as shown in Figure A5.30 of Annex 5 taken from the 2014 CMR, the pence-per-minute price of fixed UK geographic calls (including line rental) increased by around 15% in 2013 and, for the first time after years of being below the retail F2M price, the price of fixed calls to geographic numbers (including line rental) matched the average price of F2M calls. In 2014 the fixed geographic call price (including line rental) rose above that of fixed to mobile calls (which remained flat in nominal terms). In contrast, in 2008 F2M calls were on average 74% higher than fixed calls to UK geographic numbers (including line rental).[290]

6.187 We also consider that reductions in MTRs may have been passed through to fixed consumers in other forms. In particular, as MTRs are reduced FCPs may have an incentive to reduce line rental charges (or increase them less than they otherwise would) or other parts of the fixed retail tariff, to attract more customers given the higher profit margins on calls to mobiles when MTRs are reduced. A possible counterargument to this was provided by Vodafone which pointed out that line rental charges have been increasing in recent years. However, the 2014 CMR suggests this could be at least partly explained by FCPs increasingly including a bundled call

[289] In contrast, the overall level of pass-through (i.e. across business and residential customers combined) was significant in each of the years in the period 2011-2013,and significantly higher than the pass-through to residential customers. However, we have not considered business customers within our assessment of the impact on vulnerable consumers.

[290] The price of fixed UK geographic calls referred to here includes line rental because fixed line rental increasingly provides an inclusive call allowance. Thus the price per minute will have increased in large part due to the fall in the volume of geographic calls. See Figure 5.64 Page 354 2014 CMR. The fall in the volumes of fixed line calls per person can be seen in Figure 5.63 of the 2014 CMR.

allowance with the line rental.[291] It is very difficult to disentangle the effect of reductions in MTRs from other factors that affect line rental charges, such as the inclusion of call allowances.

6.188 Vodafone said that BT's calling plan for vulnerable consumers, BT Basic (a social tariff provided by BT as part of its universal service obligation), does not treat mobile calls as part of its inclusive minutes and calls to mobiles from this tariff appear to be 12ppm, plus rounding, plus a 15p call setup fee. Vodafone said that, at MTRs of 0.845ppm, evidence of how such customers may have gained from lower MTRs is non-existent. BT Basic does not include F2M calls within the call allowance, which are priced at the standard BT rates for BT Basic customers. However, as discussed above, a significant proportion (39%) of MTR reductions was passed on to residential consumers between 2011 and 2012, including vulnerable consumers. As shown in Figure A5.29 in Annex 5, F2M prices for residential customers were then relatively flat until the later quarters of 2013 when they increased slightly (although at this time the MTR was flat and we note that other fixed line services having been subject to retail price increases – see paragraph 6.186 above).

6.189 For fixed and mobile vulnerable consumers, the overall effect of MTRs converging to LRIC may be ambiguous – it is possible that lower retail prices for fixed line services may be counterbalanced by certain higher mobile prices, perhaps particularly for low use pre-pay customers. However, fixed-only customers are likely to gain under MTRs at LRIC, even if the benefits we have seen so far for residential customers are not as great as we might have expected.

Asymmetry of Risk

6.190 Telefonica argued that if our MTR falls below LRIC because of modelling errors, the negative welfare implications would primarily fall on lower usage consumers who seem more likely to be vulnerable. Telefonica (and also Vodafone) therefore said that distributional considerations meant that there was an asymmetric risk.

6.191 We do not believe that the impact on retail prices if MTRs fell unintentionally below LRIC would be significant. As we set out above, the difference between our upper bound and base case LRIC estimates is such that even with a full waterbed effect in retail bills the maximum likely average effect per adult subscriber is likely to be less than £0.60 p.a. and less still if we consider the impact per subscription.[292]. If the waterbed effect is less significant than previously thought, the impact on retail subscribers would be commensurately less. Either way, we do not see the effects from any potential forecast error as likely to produce any material adverse effects on consumers.

6.192 Indeed, market developments show that despite significant reductions in MTR levels between 2011 and now, the impact on pre-pay prices has been limited (see Annex 5). We therefore do not think there is any significant asymmetry of risk.

Summary on vulnerable consumers

6.193 In summary, we do not think that the empirical evidence considered in the round suggests that market outcomes have been worse for vulnerable consumers under

[291] Page 328-329, 2014 CMR.
[292] See footnote 231.

LRIC compared to the outcomes that might have been expected under LRIC+. We also do not believe that vulnerable consumers are particularly exposed to any significant asymmetry of risks with respect to forecast error in the setting of the charge control.

Commercial and regulatory consequences

6.194 When deciding on an appropriate remedy, including the appropriate cost standard to apply for a charge control, we recognise the need to take into account the practical implications of each option and to look at other impacts on industry such as the risk of regulatory failure and the burden of regulation for each approach.

6.195 In our June 2014 Consultation, we said that we did not consider the commercial and regulatory consequences to be significantly different between LRIC and LRIC+, not least given the low impact on overall industry revenue and EBITDA. We said the two-sided character of MCT implies that any potential risk of setting an MTR too low would be attenuated by the ability of MCPs to recover costs on the retail side of the market. Furthermore, we said we had not seen any adverse regulatory or commercial consequences in the last two years that might suggest that the progressive reductions down to what are, since April 2013, LRIC based MTRs, carry significantly more risks than capping MTRs at LRIC+.

6.196 BT and H3G agreed with our analysis. EE, Vodafone, and Telefonica argued there may be asymmetric risks from the possibility of regulatory error in modelling LRIC, with greater harm from a modelled estimate that turned out to be too low than one that turned out to be too high. In this regard, Telefonica emphasised the risks to allocative efficiency, while EE and Vodafone[293] argued that there would be risks to both allocative and dynamic efficiency. In response to this perceived risk, these stakeholders proposed either setting the MTR at LRIC+ (which Vodafone in particular advocated); maintaining the current existing mark-up above LRIC (suggested by Telefonica); or by erring on the side of caution when choosing the parameter values within Ofcom's cost modelling (EE, Vodafone, and Telefonica all proposed this approach). They also suggested that risk asymmetry could be dealt with by the use of a glide path. We address stakeholder comments on the issue of a glide path in Section 8.

6.197 We have considered earlier in this section whether there is any asymmetry of risk in allocative or dynamic efficiency, and have concluded there is no significant risk in this regard. Therefore, we do not agree that we should be cautious in our modelling of LRIC such that we should cap MTRs above our central estimate of LRIC. We consider that the choice of LRIC over LRIC+, as well as the way we have calculated the LRIC rate, is an appropriate approach in light of our duties.

6.198 BT, Virgin Media and [✂] suggested that this alignment was an important factor in our choice of LRIC. BT also argued that it was desirable to have a consistent approach to the regulation of MTRs and FTRs, and suggested that there would be significant upheaval from moving away from LRIC now, and so a very compelling reason would be needed for such a change. Virgin Media argued that deviating from a LRIC standard could seriously undermine regulatory certainty within the industry.

[293] Vodafone, in its initial submission, suggested that the higher risk to below LRIC MTRs stemmed from considerations of dynamic efficiency. In later submissions it suggest that this was due to allocative efficiency and distributional considerations, rather than dynamic efficiency considerations.

6.199 We think it is important to maintain regulatory consistency in the cost standards used for regulating FTRs and MTRs. Finally, our decision to cap MTRs at LRIC is in line with the 2009 EC Recommendation in favour of LRIC and the practice of the majority of other EU countries.

6.200 Therefore, we do not consider that commercial and regulatory consequences warrant the capping of MTRs at a level above LRIC, either by imposing some uplift to our central estimate of LRIC, or by selecting parameter values in the MCT cost model to deliver a unit cost higher than our central estimate of LRIC.

Conclusion on the appropriate cost standard

6.201 Our framework for assessing the appropriate cost standard involves balancing considerations of allocative and dynamic efficiency, competition effects, effects on vulnerable consumers, and commercial and regulatory consequences.

6.202 Our assessment is that, for the period 2015 to 2018, LRIC remains the appropriate cost standard for the MTR charge controls. This is because:

- We consider that LRIC facilitates more effective competition. We believe that MTRs above LRIC risk reducing effective competition, adversely affecting, in turn, consumers.

- We do not believe that allocative efficiency considerations necessarily point to an optimal MTR above LRIC. Moreover, it is misleading to consider allocative efficiency and other static effects separately from the effects on competition. Any attempt at fine-tuning a mark-up over LRIC, either on the basis of a simplified Ramsey-pricing model or some attempt at a more sophisticated version to capture the complex pricing structures and competitive dynamics in the mobile market, is likely to be challenging and the scope for welfare gains is likely to be small (and could even be negative).

- We have considered the various mechanisms through which lower MTRs could affect dynamic efficiency, and have investigated the possibility that lower MTRs could reduce the return on investments made by MCPs. We have concluded that if such an effect were present it would be very small and most unlikely to discourage efficient investment. Empirical evidence suggests that investment has not been harmed by previous, much larger, falls in MTRs, and we do not consider that effects on investment and innovation would be any more pronounced now.

- We have found little empirical evidence to suggest that MTR reductions have harmed vulnerable consumers.

- We have also considered whether there exists an asymmetry of risk, whereby modelling errors that resulted in an MTR below the outturn LRIC would be more harmful than MTRs above. However, we do not accept that MTRs below LRIC, to the small extent that could occur through modelling error, would have a greater adverse impact on competition, efficiency or distributional effects than MTRs the same amount above LRIC.

- We also consider that regulatory certainty is important and note that our decision is consistent with the 2009 EC Recommendation, which recommends that termination rates be set at LRIC, and with our recent decision to cap FTRs at LRIC (over the period 2014 to 2016).

6.203 We therefore conclude that for the period of this review it is appropriate to continue to cap MTRs at LRIC, as was the case in the previous MCT review.

Section 7

Calculating the efficient costs of MCT

Introduction

7.1 In Section 5 we concluded that it was appropriate to set cost-based charge controls for MCT on all the MCPs identified as having SMP. In Section 6 we concluded that the appropriate cost standard to use for setting MTRs was LRIC.

7.2 In order to calculate the efficient level of costs for MCT, we have built a cost model ('the 2015 MCT model').[294] The 2015 MCT model updates the 2014 MCT model that was published as part of the June 2014 Consultation.

7.3 In this section we summarise our conclusions for the cost modelling and the key modelling assumptions.

7.4 This section is intended as an overview of the key modelling decisions. Responses from stakeholders to our proposals in the June 2014 Consultation are provided in Annexes 7 to 13. Annexes 7 to 13 also provide the more detailed aspects of the model design, assumptions and implementation.

7.5 Detail on the implementation of the charge control can be found in Section 8.

Overview of 2015 MCT model

7.6 The 2015 MCT model uses a bottom-up approach to calculate the cost of MCT for an average efficient national MCP.[295] The model allows us to calculate the forward-looking economic cost for MCT independently of any particular MCPs business model or choice of technology. We used this same approach in the 2014 MCT model and previous models used to set MTR charge controls.[296]

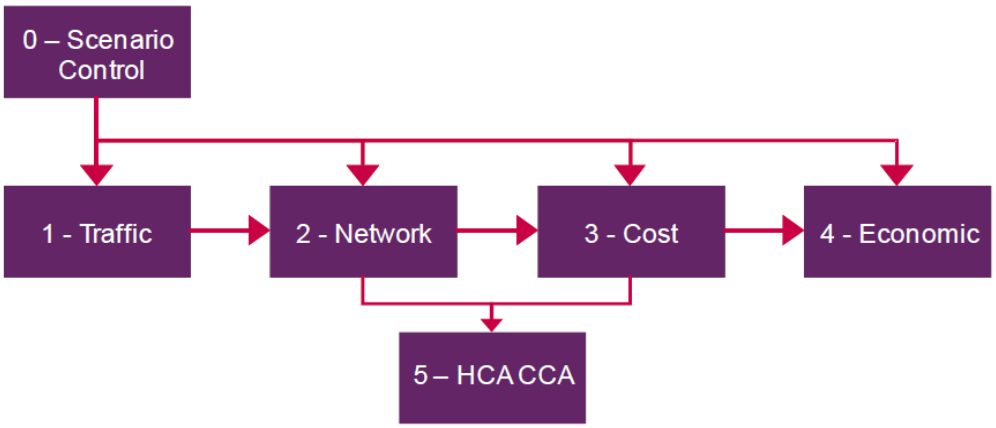
7.7 Although we have not changed our general approach to modelling, we have made changes to specific parts of the model as a result of stakeholder responses to the June 2014 Consultation and new data that we have collected. These changes are discussed further below and in more detail in Annexes 7 and 11.

Model design

7.8 The structure of the 2015 MCT model design is the same as that which we outlined in the June 2014 Consultation. The 2015 MCT model comprises six modules, each of which represents an Excel workbook, as shown in Figure 15 below.

[294] The '2015 MCT model' has been used to calculate the efficient level of costs for MCT for this statement. For the June 2014 Consultation we calculated the efficient level cost for MCT using the '2014 MCT model'.
[295] By 'national MCP' we mean an MCP with a national RAN, who has independent control of spectrum.
[296] The 2011 MCT model, 2007 MCT model and 2004 MCT model all used this approach.

Figure 15: Structure of the 2015 MCT model



Source: Ofcom.

7.9 The functions of these modules are described in Annex 7.

7.10 Since the model calculates the LRIC of MCT by seeing how much cost is avoided by removing MCT traffic from the full traffic network (as explained later in this section), we first describe below how the costs of the full traffic network are obtained:

a) Step 1: Calculate the network traffic (both voice and data) that is carried by the modelled MCP;

b) Step 2: Dimension a network capable of carrying this traffic;

c) Step 3: Calculate the cost of the assets in the dimensioned network;

d) Step 4: Recover the costs of the network over time using an economic depreciation algorithm; and

e) Step 5: Recover the cost of the network across services based on the routing factors used to dimension the network.

Calculating LRIC

7.11 We have not changed our approach to calculating the LRIC of MCT from that proposed in the 2014 MCT model. Consistent with the 2009 EC Recommendation, our approach involves considering MCT as a 'final increment' with no common costs (such as the common costs of a 'coverage network') being allocated to MCT.

7.12 The incremental costs associated with incoming voice traffic are derived by first calculating the model outputs (i.e. service demand, asset volumes and cashflows for each network element) with incoming voice traffic included and, second, with incoming voice traffic excluded. The incremental service demand, asset volumes and cashflows for each network element are then used as inputs to the economic depreciation algorithm. The output of this algorithm is the LRIC of an incoming minute of voice traffic.

7.13 The outputs of the 2015 MCT model are ppm unit costs (either LRIC or LRIC+) in each year for MCT. The 2015 MCT model works in real terms using CPI inflation indexed to 2012/13 prices, and all outputs are stated on this 2012/13 basis of prices.

Traffic volume forecasts

7.14 Telecommunication networks are characterised by economies of scale: greater volumes of traffic, caused by market growth or increased market share, lead to a smaller proportionate increase in total network cost. Similarly, the presence of common costs means that there are economies of scope from the provision of more services. Therefore, there is an important relationship between network traffic volumes and the unit costs of network services.[297]

7.15 The 2015 MCT model is dimensioned to carry the total demand of an average efficient MCP for each of the following services:

i) Incoming, outgoing and on-net voice calls for 2G, 3G and 4G;

ii) SMS and MMS for 2G, 3G and 4G;

iii) 2G packet data;

iv) 3G handset packet data;

v) 3G data device packet data;

vi) 4G handset packet data; and

vii) 4G data device packet data.

7.16 We have updated the traffic volumes used in our 2014 MCT model with data for three additional quarters in order to reflect the most recent evidence available. In addition, we have also made some changes to our volume forecasts as a result of responses to the June 2014 Consultation and more recent evidence. Most notably we have:

i) Increased the growth in penetration of mobile data devices in order to better reflect the adoption of tablet devices by consumers. In response to newer data which shows a slight decline in mobile handset penetration, we have modified the forecast for mobile handset penetration so it is broadly flat;

ii) Increased the 4G data demand per subscriber and ensured that it is never lower than the 3G data demand per subscriber; and

iii) Revised our SMS forecast slightly downwards in light of the most recent data from the four largest MCPs.

7.17 Further details of stakeholder views to the June 2014 Consultation, our responses to those views and a detailed breakdown of our traffic forecasts and our selected base-case scenario can be found in Annex 7.

Technology choice, network dimensioning and costs

7.18 The 2015 MCT model calculates the network costs (for an average efficient MCP) of delivering voice and data services to an end user. In addition to the traffic volumes,

[297] We would expect to see an inverse relationship between traffic volumes and the LRIC+ per unit of network services. Traffic volumes and the LRIC per unit of network services do not have such a clear relationship due to LRIC not including common costs.

the costs of the network are also driven by the number of subscribers and the coverage requirements. However, the majority of costs are driven by the volume of network traffic.

7.19 These cost drivers (i.e. coverage, traffic and subscribers) are used to determine the required network infrastructure deployment of the average efficient MCP. The resulting network is designed to be able to carry all the traffic volumes that are forecast to pass over it.[298]

7.20 With regard to market shares, our modelling continues to presume that the average efficient MCP holds a 25% share of all mobile subscriptions in the long term.[299]

7.21 The 2015 MCT model calculates the capital and operating costs associated with network equipment, and classifies equipment as falling within the following parts of the network:

- The RAN, i.e. cell sites, base station equipment and the associated base station or radio network controller equipment;
- Backhaul i.e. transmission links between distributed RAN equipment (i.e. at mast sites), aggregation hubs, and the core network;
- Backbone i.e. transmission within the core network; and
- Core network i.e. the equipment within the core network.

7.22 The 2015 MCT model has been revised to reflect changes in network design, technology and cost trends since the development of the 2011 MCT model. We have also updated the network design and cost trends in the 2015 MCT model based on further information provided to us by the four largest MCPs in response to section 135 information requests and information received in response to the June 2014 Consultation.

7.23 In Annexes 7, 8 and 11 we have provided further discussion of stakeholder responses to the proposals in the June 2014 Consultation and our analysis and conclusions for the 2015 MCT model. In this section, we highlight some of the key decisions.

Inclusion of 4G technology and VoLTE

7.24 Since the 2011 MCT model was developed, 4G data has become a proven technology in the UK and all four largest MCPs currently provide data services over 4G networks.

7.25 Given the increasing importance of data as a proportion of total mobile network traffic, we proposed in the June 2014 Consultation to include 4G data in the model in order to capture the effects of economies of scope in the provision of mobile

[298] When the 2015 MCT model is dimensioning the modelled network it does so using a one year 'lookahead' (i.e. it builds the a network big enough to carry the next year's traffic).
[299] As shown in Annex 7, the market share of our average efficient MCP reaches 25% in 2025/26 and then remains constant.

services. We remain of the view that the inclusion of 4G data services will appropriately reflect the forward-looking efficient costs of mobile service provision.

7.26 Based on stakeholder responses to the June 2014 Consultation and updated information that we have collected, we still believe that it is appropriate to include VoLTE[300] technology in the 2015 MCT model. We recognise that VoLTE is at an early stage of development and its costs are still uncertain, however, the evidence we have is consistent with VoLTE being deployed by MCPs during the control period[301] and so we have included it in the 2015 MCT model. We consider VoLTE to be an "*efficient technolog[y] available in the timeframe considered by the model"*, as envisaged in paragraph 12 of the 2009 EC Recommendation.

Continued inclusion of 2G and 3G technology and updates to network design

7.27 In the June 2014 Consultation we considered that it would not be appropriate to build a 4G-only network model. Based on responses to the June 2014 Consultation, we continue to consider that it would be unreasonable to assume that an MCP in the UK would be able to reach the market share of our modelled average efficient MCP if it offered a 4G-only network. This is because the current take-up of active 4G handsets is too low. In other words, an MCP is unlikely to be able to reach the market share assumed for our modelled operator without deploying 2G and 3G networks.

7.28 Furthermore, industry expectations point to the continued existence of 2G and 3G networks over the next charge control period. The presence of 2G and 3G networks is necessary to serve customers with 2G and 3G handsets and to support international roaming customers who require access to 2G and 3G networks. We show in Annex 7 that other NRAs are continuing to model 2G and 3G technologies through the period of the next charge control.

7.29 Therefore, we do not consider it appropriate to model a 4G-only network, and have decided to continue to include both 2G and 3G technologies in the 2015 MCT model.

7.30 We have made revisions to the 2G/3G network design to reflect developments since the 2011 MCT review. These include:

- Changes to the HSPA network to accommodate increases in the capacity of HSPA assets;
- Changes to the backhaul design with the addition of further high-speed backhaul options;
- Changes in transmission infrastructure to the core network ('hub to core');
- Changes in backbone infrastructure within the core network; and
- Changes to network parameters used to dimension the 2G and 3G network that reflect the passage of time since the development of the 2011 MCT model.

7.31 In response to stakeholders' comments on the June 2014 Consultation and the 2014 MCT cost model, we have made a number of adjustments. These include:

[300] Voice over LTE (VoLTE).
[301] We discuss the inclusion of VoLTE in the 2015 MCT model in more detail in Annex 7.

- Updates and refinements to our network dimensioning calculations, including improvements in backhaul capacity;
- Adjustments to certain cost drivers;
- The inclusion of 3G cell breathing;
- Modifications to the voice and data busy hour inputs; and
- Modifications to the eNodeB utilisation.

7.32 In light of responses to the June 2014 Consultation, we have examined the latest evidence available to us on voice over WiFi (VoWiFi) services, but we have decided not to incorporate this functionality in our model. We do not believe it is appropriate to include VoWiFi due to the considerable uncertainty about VoWiFi traffic and the lack of evidence that it will form a material proportion of total voice traffic.

7.33 We discuss our approach to these issues in detail in Annexes 7 and 8.

Spectrum holdings

7.34 We have decided to use the following spectrum holdings for our modelled MCP in the 2015 MCT model. We believe that these spectrum holdings reflect the holdings that an average efficient MCP could be assumed to hold, although we note that these do not necessarily reflect the actual holdings of any current MCP. These spectrum holdings assumptions are unchanged from the June 2014 Consultation. Further discussion of spectrum holdings can be found in Annex 11.

Table 14: Spectrum holdings of average efficient MCP in the 2015 MCT model

Band	Holding (paired MHz)		Technology
800MHz	10		4G
900MHz	0		n/a
1800MHz	30	20	2G
		10	4G[302]
2.1GHz	10, increasing to 15 in 2012/13		3G
2.6GHz	10		4G

Source: 2015 MCT model.

Inclusion of S-RAN technology

7.35 In the 2011 MCT model we assumed that 2G BTSs[303] and 3G NodeBs[304] remained as separate network elements in the RAN.

[302] Following refarming in 2012/13.
[303] Base Transceiver Station or Base Station.

7.36 Since 2011 equipment vendors have designed 'combined' base stations that provide 2G, 3G and 4G functionality (or a combination of 2G, 3G and 4G functionality). This combined equipment is often referred to as single-RAN (S-RAN) equipment.

7.37 We have gathered evidence from MCPs that indicates the use of S-RAN equipment is becoming widespread.

7.38 Deploying S-RAN equipment has the potential to lower costs when compared to deploying separate 2G BTSs, 3G NodeBs and 4G eNodeBs.[305] Therefore, we have concluded that an average efficient MCP with a 2G, 3G, 4G network configuration would deploy S-RAN technology and have included the impact of deploying S-RAN in our 2015 MCT model.

7.39 In response to stakeholders' comments on the June 2014 Consultation and the 2014 MCT cost model, and following further evidence obtained from the four largest MCPs, we have made some adjustments to the way the costs of S-RAN assets are allocated using network traffic that is carried over 2G, 3G and 4G technologies. This reallocation better reflects the use of S-RAN assets by traffic on these technologies. We discuss our approach to implementing S-RAN in the 2015 MCT cost model in Annexes 7 and 8.

Inclusion of active infrastructure sharing

7.40 The 2011 MCT model allowed for the sharing of passive infrastructure (i.e. cell sites and masts only). However, since the development of the 2011 MCT model, MCPs have extended infrastructure-sharing to also include active infrastructure (i.e. the electronic equipment housed within base stations).

7.41 Based on the evidence we gathered, we included active infrastructure sharing in the 2014 MCT model. Seven of the nine geotypes[306] used in the 2014 MCT model included infrastructure sharing.[307] Following the June 2014 Consultation, we have reviewed the most recent evidence available and established that some infrastructure-sharing should also be assumed in the Suburban 1 geotype. This means we have increased the geographic extent of active infrastructure sharing. We discuss the detail of implementation of active RAN-sharing in Annexes 7 and 8.

Asset cost inputs

7.42 Once the model has determined the amount of network equipment required, it assigns capital expenditure and operating cost to that equipment. In determining the capital expenditure and operating costs of different network assets, we use information provided to us by the four largest MCPs.

7.43 Since the June 2014 Consultation, we have updated the capital and operating cost trends using the latest evidence from MCPs. We have also extended some of the forecast operating cost trends so they now do not become flat until 2025/26. Further details on our asset cost inputs can be found in Annexes 7 and 8.

---

[304] Analogous to a 2G Base Station.
[305] 4G "evolved NodeBs", are analogous to 3G NodeBs and 2G Base Stations.
[306] 'Geotypes' are used as a means of mapping different geographical segments of the UK according to the likely density of traffic and building clutter that is experienced in those segments.
[307] The Urban and Suburban 1 geotypes did not include active infrastructure sharing.

Non-network costs

7.44 In addition to network costs, non-network costs are included in the 2015 MCT model, specifically administrative costs. These costs are only used to calculate the LRIC+ of MCT. They are not included in the calculation of the LRIC of MCT since administrative costs are common costs and are not treated as sensitive to termination traffic.

7.45 These administrative costs include general overheads and are described in more detail in Annex 11. The administrative cost in each year is allocated between network and retail services, with the allocation to network services attributed in proportion to those services' share of total network costs.

Cost of capital

7.46 We have calculated a pre-tax real WACC for an average efficient MCP of 7.0%. This is an increase from the pre-tax real WACC used in the June 2014 Consultation of 6.9%. This WACC estimate is "real" in the sense of having been deflated for CPI inflation, which is consistent with the use of CPI as the inflation index in the 2015 MCT model. We discuss our approach to calculating the WACC in Annexes 10 and 13.

Cost recovery over time

7.47 The 2015 MCT model produces lifetime capital expenditure and operating expenditure for each network element over the life of the modelled network. We determine how these costs are recovered over time by using an economic depreciation algorithm.

7.48 We have decided to use a form of economic depreciation know as Original ED, as proposed in the June 2014 Consultation. This is the same economic depreciation approach that was used in the 2011 MCT model as well as the 2007 and 2005 MCT models. This method matches the cost of equipment to its actual and forecast usage over the long term. Consequently, there is relatively little depreciation in years when utilisation is low and relatively high depreciation in years of full, or almost full, equipment utilisation. As a result, the path of unit costs is determined by the profile of equipment costs and the WACC, not by the path of asset utilisation in each year. We discuss our approach to cost recovery over time in Annex 7.

Calibration

7.49 Although we have constructed a bottom-up model of an average efficient MCP, the model is calibrated against actual data provided by the four largest MCPs in response to our formal requests for information. The calibration exercise is used to ensure that the model provides reasonable estimates of an average efficient MCP's efficiently incurred costs. The calibration focusses on the asset counts for key network equipment used by the national 2G/3G/4G MCPs and accounting costs based on data included in their management (or statutory) accounts.

7.50 Following the June 2014 Consultation, the model has been recalibrated by using the most recent top-down (financial) data gathered from the four largest MCPs. Our explanation of this calibration exercise can be found in Annex 9.

Summary of model results

7.51 In Table 15 we provide our base case LRIC forecasts using the 2015 MCT model.

Table 15: Forecast LRIC of MCT (ppm, 2012/13 prices)[308]

	Current MTR (from 1 April 2014)	From 1 April 2015	From 1 April 2016	From 1 April 2017
Base case	0.826	**0.502**	**0.491**	**0.476**

Source: 2015 MCT model.

7.52 In Table 16 we provide the base case LRIC+ outputs using the 2015 MCT model.

Table 16: Base case LRIC+ outputs (ppm, 2012/13 prices)

	From 1 April 2015	From 1 April 2016	From 1 April 2017
Base case	0.891	0.845	0.788

Source: 2015 MCT model.

[308] The values shown in this table are slightly different from those shown in Table 1 because the latter shows the calculated MTR caps, expressed in 2012/13 prices and using rounding, whereas this table shows the raw LRIC of MCT outputs of the 2015 MCT model.

Section 8

Implementation of the charge control

Summary

8.1 In Section 5, we concluded that it was appropriate to impose a charge control on MCT provided by all MCPs with SMP. In Section 6, we concluded that MTR charges should be capped on the basis of LRIC.

8.2 This section explains our conclusions relating to implementing the charge control and how we will assess compliance with it. In particular, we set out our conclusions to:

- index the MCT charge control using a CPI-X formulation;
- set a three year charge control between 1 April 2015 and 31 March 2018;
- set a single MTR cap for all MCPs with SMP;
- set a charge control based on a maximum cap at all times of day (rather than one based on a weighted average of time of day rates);
- Implement an adjustment towards the new LRIC rate in the first year of the control (i.e. 2015/16) with MTRs in the first year mid-way between the current nominal MTR (0.845ppm) and the new forecast nominal LRIC rate, and the MTR capped at the new LRIC rate from the start of the second year of the three year control (i.e. from 1 April 2016); and
- allow a short transition period at the start of the charge control period. Until 31 April 2015 the cap will remain at the level prevailing in the current control year of 0.845ppm.

8.3 We also set out our view that the relevant legal tests are satisfied in relation to our decision to impose a single charge control based on LRIC on all the MCPs designated as having SMP.

8.4 Annex 3 sets out the SMP conditions in relation to the charge control for MTRs.

Form of charge control

Proposals in the June 2014 Consultation

8.5 We proposed to apply price-cap regulation in the form of an inflation indexed control, in which the cap is updated annually for inflation minus an adjustment (i.e. “X” in CPI-X).

8.6 We proposed to use CPI as the inflation index in the charge control on MTRs. Therefore, we proposed the charge control would be in the form of CPI-X.

8.7 We proposed a three-year charge control period that would run from 1 April 2015 to 31 March 2018.

8.8 We proposed to set an absolute maximum cap on MTRs (consistent with the approach taken in the 2011 MCT review).

8.9 We proposed to round the MCT cap to three decimal places and that the MTR billed by an MCP would be rounded to three decimal places when judging whether it is compliant with the cap. We also proposed to publish the nominal cap that applies to MCT prior to each year of the control.

Responses to the June 2014 Consultation

8.10 We did not receive any comments on these proposals.

Ofcom's analysis and conclusions

Inflation indexed charge control

8.11 An inflation indexed charge control is a well established way to set charge controls in the telecoms sector and in many other areas of economic regulation.

8.12 The reason for using an inflation index in the charge control formula is to protect the regulated firm and customers from inflation forecast error. If inflation rises by more than forecast, the annual update of inflation in the formula protects the firm from the cap being tighter than intended. Similarly, if inflation rises by less than forecast, the annual updating of the cap for inflation ensures that customers do not pay more than necessary to compensate the firm for general inflationary pressures.

Choice of inflation index

8.13 Inflation features in the setting of charge controls in two ways:

- First, to determine how the limit on prices is updated each year (e.g. in the form of CPI-X); and
- Second, when setting a charge control based on forecast costs, the cost inputs will typically be forecast to vary over time (and the cost of different inputs will vary in different ways – e.g. operating costs may vary differently from asset replacement cost trends).

8.14 In this section we are concerned with the first point i.e. how we should index the charge controls on MTRs. The question of how the cost of different network elements should be forecast to vary over time in our modelling is addressed in Section 7 and Annexes 7 – 13.

8.15 Consistent with our approach in the June 2014 Consultation, we have considered whether to use RPI or CPI as the measure of inflation for indexing the charge control for MTRs against the following factors:[309]

[309] In addition to RPI and CPI, another possible alternative could be RPIJ. However, while a historic time series for RPIJ has been produced by the ONS (with annual changes calculated back to February 1998), we are not aware of independent forecasts, over a sufficiently long time horizon being available. Moreover, the recent *UK Consumer Price Statistics: A Review* by Paul Johnson (http://www.statisticsauthority.gov.uk/reports---correspondence/current-reviews/range-of-prices-statistics.html, 'the Johnson Review') found that RPIJ was not much used, seemed to cause

- Official status of the index: RPI stopped being classified as a National Statistic by the UK Statistics Authority (UKSA) in March 2013, largely because it did not meet international standards – in particular due to flaws in the averaging formula for measuring price changes.[310] In contrast, CPI remains a National Statistic, does not use the flawed formula inherent in the RPI, and is the basis of the inflation target used by the Bank of England. We consider that these are good reasons to prefer CPI over RPI.

- Cost causality: based on our analysis neither RPI nor CPI seem better at tracking the underlying costs of MCT.

- Exogeneity: Since CPI and RPI are both macroeconomic variables and the data are gathered by the ONS, each index is exogenous to the actions of individual MCPs or their customers.

- Availability of independent forecasts: We typically use an independent forecast for inflation. Since RPI and CPI are widely used in the UK economy they are regularly forecast by analysts. CPI has the added advantage of forming the basis of the Bank of England's inflation target.

- Regulatory predictability: CPI has not been used in the regulation of previous MCT charge controls (which used RPI for indexation). However, CPI was used in the 2014 FAMR Statement in relation to the LLU, WLR and WBA charge controls which came into effect on 1 July 2014. CPI was also used by Ofcom in setting the safeguard caps on second class stamps.

Use of CPI

8.16 In light of the above and in accordance with our proposals in the June 2014 Consultation, we consider that CPI is the appropriate inflation index to use in the charge control on MTRs. Therefore, the charge control uses a CPI-X formula.[311]

8.17 The term X in the CPI-X formula contains a so-called geometric conversion factor to ensure that the charge control reaches the correct nominal MTR.[312] This requires a

---

confusion and ultimately should be discontinued (Summary and Recommendations. p.23). Therefore, we consider that RPIJ would not be suitable for the purposes of the 2015 MCT review and have focussed on whether RPI or CPI should be the measure of inflation for indexing the charge control.

[310] See *National Statistician announces outcome of consultation on RPI* at http://www.ons.gov.uk/ons/rel/mro/news-release/rpirecommendations/rpinewsrelease.html and the de-designation report at *Assessment of compliance with the Code of Practice for Official Statistics: The Retail Prices Index, Assessment Report 246,* March 2013 at http://www.statisticsauthority.gov.uk/assessment/assessment/assessment-reports/assessment-report-246---the-retail-prices-index.pdf .

[311] We are aware that the recent Johnson review (Ibid.) has recommended that the ONS should move towards making CPIH (which includes owner occupiers' housing costs) its main measure of inflation (Ibid. Summary and Recommendations p.16). However, this is the recommendation of an independent review, which itself notes that CPIH is not currently a National Statistic – CPIH had its designation as such suspended over concerns with the calculation of housing rents. ONS will consult in summer 2015 on proposals. Moreover, we are not aware of there being a wide range of independent forecasts for CPIH. For these reasons CPIH would not score well on the factors used in evaluating the choice of inflation index above.

[312] While we often use the short-hand CPI-X, the formula could be written CPI+X, as the value of X could be positive or negative. Since this formula is additive, in order to avoid a mathematical error from the difference between a cap expressed in additive terms (i.e. CPI+X) and the fact that inflation

forecast of inflation in the calculation of X, and we have used the average of independent forecasts compiled by HM Treasury.[313]

Timing and duration of the charge control

8.18 The 2015 MCT review has a forward-looking period of three years, in line with the requirement in the Act and the Directives (as amended) that ordinarily a market review should be conducted within three years of the previous review.[314] We believe that it is appropriate to set SMP conditions based on our analysis of potential market developments over the three-year period and to align the charge control with this period.

8.19 Therefore, we have decided to set a three-year charge control period that will run from 1 April 2015 to 31 March 2018.

An absolute maximum cap

8.20 As explained in the June 2014 Consultation, we consider that the absolute maximum cap imposed in the 2011 MCT Statement has been effective in removing the risk of 'flip-flopping' that would have been present under an average charge cap. For the same reasons as explained in our 2011 MCT Statement (paragraphs 10.92 – 10.104), we consider that an absolute maximum MTR cap remains a proportionate approach to preventing the potential harm of 'flip-flopping' from 1 April 2015.

Measuring compliance with the control

8.21 We believe that it is in the interests of both sellers and purchasers of MCT that we specify a common practice to ensure consistency among different interconnecting operators. Consistent with the 2011 MCT review, we will round the cap to three decimal places. As such, we will round the pence per minute MTRs billed by MCPs to three decimal places when judging whether they are compliant with the cap.

8.22 We will publish the nominal cap that applies to MCT on our website prior to each year of the control.

Scope of the charge control

Proposals in the June 2014 Consultation

8.23 We proposed a technology-neutral charge control, meaning that we proposed the same charge control for MCT regardless of the technology or platform used. In addition, we proposed an operator-neutral charge control where we set the same cap

---

and the required real reduction in prices combine in a multiplicative way, we use a "geometric conversion factor" in the calculation of X. So where Y is the real percentage change required to align current charges with forecast costs, i.e. $P_0 = (1+Y)(1+CPI).Cn$, the value of X in the 1 + CPI + X formula is given by X = Y*(1+CPI).

[313] We used HM Treasury's independent average medium-term forecast of CPI for the years 2015-2018 for the purposes of this statement (source: HM Treasury, *Forecasts for the UK economy: a comparison of independent forecasts*, February 2015, Table M3). The value of CPI for each of these calendar years is 0.5%, 1.7% 1.9% and 2%.

[314] See Art 16 of the Framework Directive 2001/21/EC, as amended by Directive 2009/140/EC. The Act was amended on 26 May 2011 to include these requirements under section 84A following amendment to the Directives on 19 December 2009.

for all charge controlled MCPs (an approach termed in this document and in the 2009 EC Recommendation as 'symmetry').

Responses to the June 2014 Consultation

8.24 BT agreed with our proposal noting that the use of a technology and operator neutral rate is beneficial as it creates a level playing field across the market.[315]

8.25 H3G agreed with our proposals but did not give further explanation for its support.[316]

8.26 Virgin Media agreed with our proposal. It considered that to set different controls based on the underlying technology would add significant complexity to an area where compliance amongst some smaller CPs has been a concern. Virgin Media argued that the mix of technologies used amongst CPs varies, and therefore different regulated ceilings would apply to different CPs, leading to potential confusion and lack of clarity.[317] Vodafone and EE suggested that smaller MCPs should not receive the maximum MTR applicable to the four largest MCPs. The points raised by Vodafone and EE are outlined and discussed in detail in Section 5.

Ofcom's analysis and conclusions

8.27 As explained in the June 2014 Consultation, we consider that an operator-neutral and technology neutral approach resulting in a single cap being applied to MTRs benefits consumers. Consumers are generally unaware of, and are likely to be largely indifferent to the type of network that their call terminates on and the technology used. With a single cap, the end user is more likely to face the same charge for what is, from their perspective, the same service.

Profile of MTRs over the charge control period

Proposals in the June 2014 Consultation

8.28 In the June 2014 Consultation, having considered the overall benefits of setting MTRs at LRIC for competition and ultimately consumers, our starting position was that MTRs should be set at LRIC as soon as possible, subject to allowing sufficient time for MCPs to adjust to the new MTR levels and, in the case of consumers, to adjust to potentially new retail prices.[318]

8.29 We assessed two price path options (summarised below) and favoured a one-off adjustment (i.e. no glide path):

i) A two-year glide path: i.e. MTRs would reduce by a fixed percentage at the start of each year of the charge control period and reach LRIC on 1 April 2017; or

[315] BT response to June 2014 Consultation, page 20.
[316] H3G response to June 2014 Consultation, page 11.
[317] Virgin Media response to June 2014 Consultation, page 4.
[318] The trade-off between setting MTRs at the estimate of the efficient cost and allowing sufficient time for adjustment to the new level was also discussed in the 2007 MCT Statement (paragraph 9.172) and the 2011 MCT Statement (paragraph 10.31).

ii) A one-off adjustment: i.e. MTRs would reduce to LRIC on 1 April 2015 and track the LRIC estimate produced by the 2015 MCT model in each subsequent year of the charge control.

8.30 We also noted that the 2009 EC Recommendation does not specify a preferred profile for the MTR cap following the recommended date of implementing MTRs at LRIC by 31 December 2012 (i.e. in subsequent charge control periods later than 31 December 2012).

8.31 We proposed that MTRs should be set with reference to the new estimate of LRIC (as determined by the MCT cost model) in each and every year of the charge control (i.e. to use a one-off adjustment as opposed to reaching the LRIC forecast in the final year of the control via a glide path).

Responses to the June 2014 Consultation

8.32 BT noted that Ofcom's usual approach to setting a charge control is to implement a glide path from the current rates at the end of the previous charge control to an appropriate cost based rate at the end of the new charge control period. BT believed that this was a sensible default approach and will in most cases have superior incentive properties. However, given the specific circumstances relating to MCT in this review, BT agreed with Ofcom's proposed approach to implementing the charge control.[319]

8.33 BT considered that Ofcom's proposed approach of setting MTRs at the estimated LRIC in each year of the control period is consistent with the approach taken in the 2013 FNMR with respect to FTRs. In addition, BT considered the following to be relevant:

- Maintaining MTRs at LRIC is not unduly disruptive as it is a perpetuation of the current approach;
- The proposed approach will reduce the asymmetry between FTRs and MTRs and promotes competition between the fixed and mobile sectors; and
- The approach is consistent with the 2009 EC Recommendation that termination rates should be "implemented at a cost-efficient, symmetric level by 31 December 2012", subject only to cost differences.[320]

8.34 Virgin Media was of the view that generally glide paths are important to allow for industry to adapt. However, it agreed with Ofcom's proposal to apply a LRIC cap for each year of the control. Virgin Media considered that this provided absolute clarity of approach and clearly aligns rates to LRIC through the control period. Virgin Media considered that, given the last control had already adjusted rates to LRIC, a glide path in this control is less material.[321]

8.35 In general, [✂] supported the use of glide paths (especially where a reduction in prices is unexpected). However, it considered that the modelling methodology has been known since the 2009 EC Recommendation and the fixed market handled a

[319] BT response to June 2014 Consultation, page 12.
[320] BT response to June 2014 Consultation, page 12.
[321] Virgin Media response to June 2014 Consultation, page 4.

larger percentage drop (and one commensurate in magnitude) in relation to the 2013 FNMR without harm. [✂] also noted that mobile operators have endured large drops in MTRs in the past. Therefore, considering the potential benefits to consumers it could see no reason for anything other than a price fall to align MTRs with the control from 1 April 2015.[322]

8.36 Verizon agreed with our proposal not to adopt a glide path.[323]

8.37 EE, Vodafone and Telefonica objected to our proposal and argued in favour of adopting a glide path for setting MTRs. For ease of assessment, we have grouped their arguments against using a one-off adjustment under three headings:

- Regulatory predictability and Ofcom's framework for adopting glide paths:
- Recovery of costs, GC9.6 and the waterbed effect.
- The cost and benefits of a one-off adjustment:

Regulatory predictability and Ofcom's framework for adopting glide paths

Consistency with past decisions

8.38 EE, Telefonica and Vodafone considered that Ofcom's proposals were inconsistent with its standard regulatory approach and stated policy position of adopting glide paths for charge controls. EE and Vodafone noted that Ofcom had previously stated that it has a 'strong preference' for glide paths, in particular because they provide stronger cost reduction incentives and a more stable and predictable regulatory environment than immediate adjustments.[324] [325] [326]

8.39 In support of their arguments, reference was made to previous charge control statements from Ofcom. These included the 2009 Leased Lines Statement, the 2013 BCMR Statement and the 2014 FAMR Statement where it was argued that Ofcom outlined its preference for adopting glide paths.

8.40 Telefonica, Vodafone and EE considered that any departure from Ofcom's general practice of adopting glide paths would need to be justified very strongly.

Ofcom's 2013 FNMR decision

8.41 EE and Vodafone argued that Ofcom's decision in relation to the 2013 FNMR (where Ofcom allowed a three month period for FTRs to reach LRIC) did not provide a relevant precedent for the MCT charge control since there was a different impact on fixed CPs caused by the switch from LRIC+ to LRIC. This was because the application of a P0 adjustment in the 2013 FNMR was in two directions, as fixed origination rates were capped at what Vodafone and EE referred to as a LRIC++

[322] [✂]
[323] Verizon response to June 2014 Consultation, page 3.
[324] Telefonica response to June 2014 Consultation, page 11.
[325] EE response to June 2014 Consultation, page 26.
[326] Vodafone response to June 2014 Consultation, page 90.

standard.[327] [328] EE and Vodafone argued, by contrast, that Ofcom expected MCPs to recover their displaced common costs from unregulated outbound services.[329] [330]

8.42 In addition, EE argued that the outcome of the 2013 FNMR was to set FTRs to LRIC for the first time and achieve regulatory consistency with MTRs that had been set at LRIC since April 2013. This differed from the current MCT review which is to update MTRs to reflect changes in costs rather than Ofcom changing its pricing approach.[331]

2012 CC Determination and relevance in Ofcom's analysis

8.43 Vodafone and EE argued that Ofcom had incorrectly taken the reasoning used by the CC (as part of the 2012 CC Determination) in considering the length of glide path, and applied this to the separate issue of whether a glide path in itself is appropriate.[332] [333]

Consideration of further glide path options

8.44 Telefonica argued that there was at least one further glide path option that might merit consideration beyond those considered in the June 2014 Consultation. It suggested that a 1 year glide path where MTRs reach LRIC on 1 April 2016 should be considered by Ofcom.[334]

Recovery of costs, GC9.6 and the waterbed effect

8.45 EE and Vodafone argued that the possibility of a P0 adjustment needed to be weighed up against the impact of Ofcom's guidance issued in 2013 (which took effect from January 2014) on GC9.6 that limits the ability of operators to swiftly pass on retail price increases to their customers arising from reductions in termination rates.[335] [336]

8.46 Vodafone argued that the waterbed has 'sprung a leak' and an extended period is needed for any reaction by operators to a termination rate cut to take place.[337] EE argued that Ofcom had failed to consider new evidence that calls into question the existence of a strong waterbed effect. EE noted that the authors of the study that the CC relied on (in the 2012 CC Determination) when deciding that the glide path should be three years rather than four years had published a new study putting forward evidence that the waterbed may have ceased to exist since 2006.[338]

---

[327] A P0 adjustment is a change to regulated prices at the start of a new charge control (i.e. at period 0) beyond that which would be seen if a glide path was used.
[328] In the 2013 FNMR Statement we decided that the charge control on BT's wholesale call origination rate should be set on a LRIC+ basis, with the "+" including an additional mark-up for common costs no longer recovered via FTRs once they were set at LRIC. Vodafone and EE referred this as a LRIC++ cost standard.
[329] Vodafone response to June 2014 Consultation, page 90.
[330] EE response to June 2014 Consultation, page 35.
[331] EE response to June 2014 Consultation, page 35.
[332] EE response to June 2014 Consultation, page 33.
[333] Vodafone response to June 2014 Consultation, page 84.
[334] Telefonica response to June 2014 Consultation, page 13.
[335] EE response to June 2014 Consultation, page 32.
[336] Vodafone response to June 2014 Consultation, page 89.
[337] Vodafone response to June 2014 Consultation, page 89.
[338] EE response to June 2014 Consultation, page 34.

8.47 EE argued that a failure to adopt a glide path could have several potential consequences to the detriment of consumers:

- [✂]
- GC9.6 limits the extent to which MNOs can pass through unanticipated cost shocks in the core subscription of fixed term contracts. [✂]
- [✂][339]

The balance of costs and benefits of adopting a one-off adjustment

8.48 EE argued that Ofcom's proposed approach does not balance costs against benefits and therefore is not guided by the principle of proportionality. Instead, EE considered that Ofcom has taken a binary approach in respect of benefits, simply noting that in its view there are some benefits of reducing prices to LRIC (and used this to justify its position of an immediate adjustment to LRIC unless there were good reasons to adopt a glide path).[340]

8.49 EE considered that Ofcom should take into account that a glide path would achieve a better balance in terms of the timing and realisation of the relative costs and benefits of reducing MTRs to the new estimates of LRIC.[341]

8.50 Vodafone argued that having established a clear precedent in previous charge controls that there was a need to enable MCPs to adjust to an industry-wide reduction in MTRs, Ofcom must provide a credible justification for departing from this approach. Vodafone further argued that, whilst Ofcom claimed that the impact on network investment plans will be limited given the amount of lost revenue (as against a counterfactual of a glide path) Ofcom had neglected to take into account or investigate that MCPs face significant constraints on investment.[342]

Financial impact of immediate change on investment incentives

8.51 Vodafone and EE argued that Ofcom's methodology for quantifying the impact on MCPs was incorrect and that the correct indicator to use for a measure of the potential impact on margins would be EBIT (as opposed to revenue or EBITDA). Vodafone explained that total revenue could be used if Ofcom was assessing the financial impact in relation to the reduction in total termination revenues (as opposed to the reduction in net termination revenues). EE argued that EBIT is a more relevant measure for capital intensive businesses. EE also argued that to better understand the disruptive impact of the adjustment to MTRs, net termination payments should be considered by reference to individual MCPs' EBIT (not on an industry wide-basis).[343] [344]

[339] EE response to June 2014 Consultation, page 33.
[340] EE response to June 2014 Consultation, page 30.
[341] EE response to June 2014 Consultation, page 31.
[342] Vodafone response to June 2014 Consultation, page 84.
[343] Vodafone response to June 2014 Consultation, page 88.
[344] EE response to June 2014 Consultation, page 30.

8.52 EE stated that, in its case, the difference between adopting a one-off adjustment compared to a glide path means it receives a net revenue reduction of approximately [✂] based on 2013 volumes.[345]

8.53 [✂][346]

8.54 EE argued that, taken with the evidence suggesting that the waterbed effect may be substantially incomplete, Ofcom's proposals would reduce the expected returns MCPs will make and, in turn, investment. Lowering the expected return on capital employed by MCPs below the levels that they are likely to have assumed in their business plans carries a strong risk of causing harm and disruption to the investment plans of MCPs. To avoid this problem EE argued that Ofcom should retain a three year glide path.[347]

8.55 Vodafone made reference to paragraph 8.74 in the June 2014 Consultation which stated "*Moreover, the reduction from LRIC+ to LRIC in the previous control period represented a much larger reduction in MTRs in both ppm and £m terms and investment by MCPs has continued steadily.*"[348] Vodafone argued that the fact that investment has "continued steadily" says nothing about how investment might have continued in the absence of significant MTR reductions. Vodafone considered that the timing of the introduction of 4G inside the present charge control and the consequent need for all operators to invest heavily in order to compete in 4G provision masked underlying drivers of investment activity. Vodafone believed that there is no guarantee that MCP investment will be able to continue in the UK in the face of adverse regulatory decisions. Vodafone noted that Ofcom judged in the ALF consultation that it should behave conservatively and Vodafone argued that the same consideration applies in the case of the MTR control.[349]

8.56 [✂] argued that since it had never previously had its MTR regulated, the proposal would have a severe impact on its business and that there must be a number of other CPs in a similar position. It noted that larger MCPs have been given many years to adjust their business models to account for materially lower MTRs and that to give its business a chance of survival it was imperative to have a much more progressive glide path.[350]

Realisation of consumer benefits from proposed change in MTRs

8.57 Vodafone argued that (in weighing up the potential benefits) of making an immediate adjustment to LRIC, it is questionable how quickly customers will benefit. Vodafone contended that there is no axiomatic immediate reduction made by fixed CPs of fixed to mobile rates in response to a reduction in MTRs, and given that most other charges made by fixed CPs to their customers with respect to voice calls appear to be rising at least as fast as inflation, there may be no pass through to fixed voice call customers whatsoever.[351]

---

[345] EE response to June 2014 Consultation, page 30.
[346] [✂]
[347] EE response to June 2014 Consultation, page 34.
[348] Vodafone response to June 2014 Consultation, page 89.
[349] Vodafone response to June 2014 Consultation, page 89.
[350] [✂]
[351] Vodafone response to June 2014 Consultation, page 89.

8.58 EE made a similar point to Vodafone stating that Ofcom has recognised that fixed CPs do not pass-through MTR reductions immediately (if at all). In contrast, a one-off adjustment would have an immediate detrimental impact on MCP's investment incentives. A glide path, by smoothing out the revenue impact on MCPs, would represent a more appropriate and proportionate approach to implementing the charge control.[352]

Asymmetric risk of charging below LRIC

8.59 Vodafone argued that once the 2014 MCT model had been revised using Vodafone's corrections, the 2014/15 MTR is either not far above or equal to the 2015/16 LRIC estimate, and very comfortably below the level of LRIC+. Vodafone argued that this is a very different set of facts from the transition at the beginning of the prevailing charge control (which began from April 2011).

8.60 Vodafone and EE argued that there was a greater risk of negative consequences from setting rates below LRIC than setting rates above LRIC. As such, since Ofcom cannot be certain that its LRIC estimate is right, given the obvious uncertainties around the timing of the transition between the three mobile technologies (i.e. 2G, 3G and 4G), Ofcom needed to be cautious in lowering the MTR too quickly. Therefore, Ofcom needed to take a conservative approach to the glide path design.[353] [354]

Ofcom's analysis

Our framework for selecting a path of prices

Consistency with past decisions

8.61 Telefonica, EE and Vodafone made reference to previous charge control decisions where Ofcom set out arguments in favour of adopting a glide path.

8.62 We do not consider that it would be inconsistent with our past regulatory practice not to adopt a glide path in this case. Where we have chosen to adopt a glide path in other market reviews, the reasons for that decision have reflected the specific characteristics of the relevant market(s). We explain below why the characteristics of termination markets differ from those considered in other market reviews.

8.63 We accept that one of the reasons to use a glide path could be the stronger incentives it provides for a regulated firm to reduce costs. These incentives result from the regulated firm being given the opportunity to keep the benefits of greater efficiency gains than forecast by the charge control for longer than a single control period. This was an important point in Ofcom's decision to adopt a glide path in relation to the recent charge controls for the 2013 BCMR and 2014 FAMR.[355] However, the markets in relation to the 2013 BCMR and 2014 FAMR differ from the MCT market in that they are both examples of access being provided in one-sided

[352] EE response to June 2014 Consultation, page 31.
[353] Vodafone response to June 2014 Consultation, page 87.
[354] EE response to June 2014 Consultation, page 35.
[355] In relation to the 2014 FAMR we also noted that "….*this does not mean we rule out one-off adjustments in prices where there are good reasons to introduce them. For example, we might make one-off changes if there are strong allocative efficiency or competition arguments for bringing charges into line with cost before the end of the control period."* (2014 FAMR Statement, Volume 2, paragraph 6.37).

markets. This is in contrast to access to termination where there is a second side of the market (i.e. subscription and origination) which is considered effectively competitive (i.e. no SMP) and where network expenditure supports both sides (i.e. both termination and origination).

8.64 As we explained in the 2011 MCT Statement and the June 2014 Consultation,[356] in a one-sided access setting, incentivising cost reducing investment is a critical part of the regulatory trade-off when setting a charge control. In general, the longer prices are not re-set to an estimate of the incurred cost of providing a service, the more powerful the incentive scheme of the price cap. It is for this reason that we typically set charge controls as long as the European Framework permits (i.e. three years) and often favour a glide path from one control period to the next in one-sided access markets.

8.65 However, as noted above, since many of the assets used to provide MCT are also used to provide other competitive services, we would expect that MCPs already have incentives to make cost efficient investments. Therefore, in the context of MCT, incentivising investment in cost reducing activities, through imposing a glide path, is of much less importance than it is in regulating access for one-sided markets.[357]

Ofcom's 2013 FNMR decision

8.66 In assessing whether to adopt a glide path for setting FTRs in the 2013 FNMR, we also considered that FTRs should be set at LRIC as soon as possible. We considered whether there were any constraints or adverse consequences associated with adjusting FTRs that would outweigh the competitive benefits of FTRs reaching LRIC as quickly as possible.[358] Therefore, the approach used in assessing whether to adopt a glide path was the same as that adopted for the 2015 MCT review.

8.67 Whilst BT considered that our proposals for setting MTRs at LRIC without a glide path were consistent with the approach adopted in the 2013 FNMR, EE and Vodafone argued that there were key differences between the 2013 FNMR and our proposals in relation to the 2015 MCT review.

8.68 Vodafone and EE made reference to Ofcom's decision to increase fixed call origination rates to what they describe as a LRIC++ cost standard at the same time as reducing FTRs to LRIC. They argued that the implication of this was that the impact on fixed CPs was moderated because they were able to recover common costs through other regulated prices.

8.69 Vodafone and EE are correct to note that in the 2013 FNMR we decided that fixed wholesale call origination would be regulated on the basis of LRIC+ but where the "+" included an additional contribution to common costs no longer recovered from setting FTRs at LRIC. However, our decision to increase fixed wholesale call origination rates was to address a competitive distortion that would have otherwise restricted cost recovery by direct access CPs (i.e. those with a terminating network) due to the

[356] Paragraph 10.33.3 of the 2011 MCT Statement and footnote 247 of the June 2014 Consultation.
[357] Further to this, we note that the MCT increment forms only a very small part of the total network costs and busy hour network traffic. The discounted network cost of the MCT increment in the 2015 MCT model is 10% of the total discounted network cost. In 2017/18, the MCT increment makes up less than 1% of the total network traffic. Therefore, we would not expect MCT to have a significant bearing on an MCP's decisions around investing in cost reducing activities.
[358] 2013 FNMR Statement, paragraphs 11.10 to 11.69.

competitive constraint provided by CPs renting network access from BT (which would not have their own terminating network) in retail call markets. The competitive distortion we were addressing in the fixed sector is not relevant to the mobile sector since no MCP is required by regulation to provide price regulated access to their mobile access network.[359] [360]

8.70 EE argued that the reason Ofcom chose not to adopt a glide path in the 2013 FNMR was because it was seeking to achieve regulatory consistency with MTRs. MTRs have been set at LRIC since April 2013, whereas FTRs were on a glide path to LRIC+ from 2009 to 2013. In EE's view, the current MCT review is seeking to update MTRs to reflect changes in costs (on a LRIC basis) rather than Ofcom changing its pricing approach (from LRIC+ to LRIC).

8.71 It is correct that in the 2013 FNMR we recognised the importance of achieving regulatory consistency between the cost standards used to regulate FTRs and MTRs. However, it is incorrect to argue that achieving consistency between the cost standard used to regulate MTRs and FTRs was the only reason for our decision not to adopt a glide path. Consistency was only one consideration for bringing FTRs down to LRIC as quickly as possible.

2012 CC Determination and relevance in Ofcom's analysis

8.72 EE and Vodafone have argued that in proposing to set MTRs at LRIC without a glide path, we have incorrectly relied on the reasoning used by the CC in considering the length of glide path, and applied this to the separate issue of whether a glide path in itself is appropriate.

8.73 We do not accept this argument. As explained earlier, we have used the same framework for assessing whether to adopt a glide path to set MTRs at LRIC as in the 2011 MCT review. As part of the 2012 CC Determination, the CC used the framework that we set out for the purposes of assessing the materiality of the costs and benefits of either adopting a three or four year glide path in the 2011 MCT review.[361] Although the evidence on which we base our assessment now has changed since the 2011 MCT review, we consider that the framework used in this review is consistent with that used by the CC in the 2011 MCT appeals for considering the materiality of the costs and benefits of alternative glide paths.

Conclusion on our framework and options for the profile of MTRs over the control period

8.74 We consider that the framework we have used in this statement is consistent with past regulatory practice and remains an appropriate framework for weighing-up the options on how quickly MTRs should be reduced to LRIC.

8.75 Turning to the options for how MTRs should be reduced through time, we note that Telefonica suggested that Ofcom should also consider a one-year adjustment to the new LRIC rate. Therefore, in this statement we use the framework described earlier

[359] For example, where retail MCPs compete without their own mobile access network they do so by commercially agreeing wholesale access from one of the national MCPs with a radio network. Access for such MVNOs is not subject to *ex ante* regulation.
[360] Moreover, the increase in fixed call origination rates permitted by the 2013 FNMR would not mean that BT would avoid tariff rebalancing.
[361] 2012 CC Determination, paragraphs 5.48 – 5.75.

to weigh-up the following options in deciding how quickly MTRs should be reduced to LRIC.

i) A two-year glide path: i.e. MTRs would reduce by a fixed percentage at the start of each year of the charge control period and reach LRIC on 1 April 2017 (i.e. the first day of the final year of the control).

ii) A one-off adjustment: i.e. MTRs would reduce to the new LRIC rate on 1 April 2015 and track the LRIC forecast produced by the 2015 MCT model in each subsequent year of the charge control.

iii) A one-year adjustment from the prevailing LRIC rate to the new LRIC rate i.e. MTRs would reduce by half the difference between the prevailing cap and the new LRIC forecast at the start of the first year of the charge control.[362] From 1 April 2016 onwards MTRs would track the LRIC forecast produced by the 2015 MCT model until the end of the charge control.

Recovery of costs, GC9.6 and the waterbed effect

8.76 We would be concerned if following a reduction in MTRs MCPs did not have a sufficient opportunity to recover efficiently incurred costs, including, as appropriate, being able to make adjustments to other prices (such as retail prices).

8.77 In response to our proposals in the June 2014 Consultation to implement a one-off adjustment in MTRs to LRIC on 1 April 2015, EE and Vodafone both made reference to GC9.6. They argued that under GC9.6 MCPs are constrained in their ability to pass through retail price increases to their customers as a result of reductions in MTRs.

8.78 As explained in our 2013 guidance, GC9.6 limits the ability of MCPs to increase post-pay subscription charges during the period of a contract.[363] Under GC9.6, where a price increase would result in "material detriment" to the consumer, a CP must notify the consumer of the change and give them the right to terminate the contract without penalty. In Ofcom's guidance on 'material detriment' under GC9.6 in relation to price rises, we explain that we are likely to treat any price increase to the agreed core subscription price during the fixed term of a contract as a modification that is likely to be of material detriment to consumer and small business subscribers for the purposes of GC9.6.[364] Since the June 2014 Consultation, we have re-examined the potential impact of reducing MTRs to the new LRIC rate from 1 April 2015 based on

[362] Taking account of any transition period as discussed later in this section.
[363] Ofcom, *Price rises in fixed term contracts: Decision to issue guidance on General Condition 9.6*, updated 22 January 2014, Annex 1 Guidance on "material detriment" under GC9.6 in relation to price rises and notification of contract modifications. http://stakeholders.ofcom.org.uk/consultations/price-rises-fixed-contracts/
[364] Ibid. The subscription price is the recurring (usually monthly) charge that the customer is contractually obliged to pay for a core package of inclusive services (such as call minutes, text messages and data allowance). Where a customer enters into a "tiered" contract – where they agree to pay different prices at different times, e.g. £x/month for the first 12 months and £y/month for the second 12 months – the total price of the contract must be made sufficiently prominent and transparent so that a customer can properly be said to have agreed on an informed basis, at the point of sale, to the relevant tiered price(s). Where that is so, the application of the agreed price(s) at the relevant time(s) would not be a modification of the amount he or she has agreed and is bound to pay.

the revised cost and volume estimates as well as the concerns raised by some MCPs.

8.79 Based on the outputs of the 2015 MCT model, we now estimate that a one-off adjustment to MTRs would represent a reduction in net termination revenues of around £54m in 2015/16 compared to the existing MTRs (at 0.817ppm in 2012/13 prices). This amounts to a reduction of around 0.3% of revenue.[365] [366] [367]

8.80 In Q2 2014, around 58% of subscribers were post-pay subscribers.[368] [369] In the year to Q1 2014 on average 65% of new post-pay contracts were for 24 months, around 21% of new post-pay contracts were for 12 months and around 15% were for one month). Therefore, under a one-off reduction in MTRs, as many as 85% of post-pay subscribers could be committed to existing contracts (i.e. combining those on 24 month and 12 month contracts), at the start of the first year of the new control – which would amount to just under 50% of total mobile subscriptions. By the end of the first year, this could fall to around one third of post-pay customers committed to existing contracts – just under 20% of all mobile subscriptions).[370]

8.81 If MCPs were to seek to recover the entire revenue reduction of 0.3% from those contractually committed post-pay customers, MCPs might seek to do so through increasing retail prices for out-of-bundle charges. Evidence gathered from MCPs indicates that around 30% of service revenue from post-pay subscribers relates to out-of-bundle usage.[371] Therefore, in order to recover the revenue reduction, MCPs would need to increase out-of-bundle charges by around 1% for this set of customers. To put this into context, with CPI currently at 0.3% (year to January 2015) and forecast to run at around 0.5% in 2015, the increase in non-core subscription prices for contract customers would exceed CPI inflation.[372]

---

[365] By 'net' reduction in MTR revenues, we mean the revenue impact of the change in MTRs (i) excluding on-net calls (which do not incur an MTR); and (ii) excluding off-net mobile to mobile call volumes since the reduction in revenues from lower MTRs matches the lower outpayments when MTRs are symmetric (i.e. 1 minute of MCT sold to another MCP is worth the same as 1 minute of MCT purchased from an MCP). Therefore, across all MCPs the revenue impact for off-net mobile to mobile calls will be zero.

[366] Our estimate is based on 2015/16 LRIC MTR = 0.502ppm; Current MTR = 0.826ppm (both in 2012/13 prices); total MCP non mobile to mobile off-net call volumes of 16.72bn minutes; total MCP service revenue (2013) £15.6bn.

[367] In comparison, a partial adjustment to the new LRIC rate at the start of the first year of the charge control (i.e. in 2015/16) would represent a reduction in net termination revenues of £28m in 2015/16 compared to the existing MTRs. This amounts to an approximately 0.2% reduction of revenue. A two-year glide path would represent a reduction in net termination revenues of £23m in 2015/16 compared to the existing MTRs (around a 0.1% reduction in revenue). These figures are in 2012/13 prices.

[368] Ofcom Data Tables Q2 2014.

[369] As outlined in Table 12 in Section 6 this figure could be as high as 65% based on the Technology Tracker results. In that table we used figures from the Technology Tracker as they provide the relevant breakdown for our assessment on vulnerable consumers.

[370] The figures assume that all contract customers sign-up for "new" contracts immediately after the expiry of their existing one and that customers are uniformly distributed within each contract length (e.g. 50% of customers on 24 month contracts will be out of contract within 12 months).

[371] For instance, as stated in Vodafone's Financial Result data for Q2 2014/15 http://www.vodafone.com/content/index/investors/investor_information/financial_results.html

[372] CPI forecast for 2015 taken from February 2015 average of independent forecasts compiled by HM Treasury. See HM Treasury, *Forecasts for the UK Economy: a comparison of independent forecasts*, February 2015, Table M3.

8.82 We recognise that the number of post-pay contracts has been growing and by the time the new charge control starts, post-pay subscribers will likely make up a larger proportion of the total subscriber base. However, MCPs are not necessarily free to adjust all their out-of-bundle charges.[373] Therefore, the actual adjustment to the retail prices of some out-of-bundle services might need to be higher than indicated above (and therefore our estimate of 1% is likely to represent the lower bound of out-of-bundle price increases). We consider that such potential price increases could be disruptive for certain customers (increasing, for example, the risk of bill shock). We also note that if MCPs were to increase retail prices in order to recover the entire revenue reduction from MTRs, this could impact on their ability to rebalance retail prices for other reasons and thereby recover efficiently incurred costs.[374]

Costs and benefits associated with not using a glide path

Financial impact of immediate change across all MCPs

8.83 EE and Vodafone argued that the reduction in net MTR revenues as a result of our proposals should have been assessed with reference to EBIT as opposed to revenue or EBITDA. We accept that when considering financial impacts on MCPs (rather than implications for potential retail price impacts) a comparison with a measure of profits rather than revenues may be more appropriate.

8.84 However, the financial impact of reducing MTRs may be under-estimated or over-estimated if EBIT is used as the relevant comparator. This is because EBIT will vary between MCPs as a result of the different methods that have been applied to depreciate various assets for accounting purposes and EBIT may not reflect the likely future cashflows in the business.[375] Therefore, we consider that a more appropriate metric to use to assess the financial impact of reducing MTRs would be EBITDA or EBITDA less capital expenditure (recognising the capital intensive nature of the network business).

8.85 Our analysis indicates that in 2013/14 EBITDA less capex across the four national MCPs totalled around £2.5bn (in 2012/13 prices). We estimate that net termination revenues would be reduced by around £54m in 2015/16 (in 2012/13 prices) as a result of a one-off adjustment to LRIC MTRs (compared to current MTRs). Based on these values, EBITDA less capex could be reduced by around 2% if retail prices were not adjusted. The option of a partial adjustment in the first year would provide additional MTR revenues of around £26m over the control period compared to a one-off adjustment (in other words, would reduce MCP net revenue by around £28m compared to today's MTR, which is close to the net revenue reduction we calculated

---

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/404865/forecomp_201502.pdf. The increase would also be comparable to current (year to January 2015) and average forecast RPI for 2015 compiled by HM Treasury.

[373] For instance, the international roaming charge for calls within the EU is capped by European legislation.

[374] We recognise that MCPs could choose to recover the reduction in net MTR revenues from increasing the retail prices for pre-pay customers. However, pre-pay revenues account for a small (and declining) proportion of retail revenues. Therefore, MCPs may be constrained in recovering the net reduction in MTR revenues through rebalancing pre-pay charges.

[375] For instance, the accounting treatment for the valuation and amortisation of spectrum and other intangible assets varies significantly between MCPs and where asset valuations do not reflect the future capital expenditure required to replace these assets the resulting reported EBIT may not reflect the likely future cashflows in the business.

for a one-off adjustment in the June 2014 Consultation). The option of a two-year glide path would provide additional MTR revenues of around £45m over the control period compared to a one-off adjustment.[376] EBITDA less capex could be reduced by around 1% in 2015/16 under a partial adjustment to LRIC in the first year and less than 1% under a two-year glide path in 2015/16.

Financial impact of immediate change on smaller MCPs

8.86 We do not accept [✂] argument that since other MCPs have been given many years to adjust their business models to set MTRs at LRIC, that this should provide a reason for adopting a glide path to allow smaller MCPs to adjust to the reduction in MTRs.

8.87 Although we have not previously imposed a charge control on all MCPs, we explained in our 2011 MCT Statement that, although new entrant MCPs would not be subject to SMP conditions, where an interconnecting CP was unable to agree terms of access with such an MCP then it could refer a dispute to us for resolution under section 185 of the Act and that we intended to publish guidance as to how we would determine what fair and reasonable MTRs would be on the facts of such a case.[377]

8.88 In April 2011 we published guidance on dispute resolution in relation to fair and reasonable charges for MCT ('the F&R guidance').[378] In this guidance, we explained that we considered the benchmark MTR (i.e. the MTR that was derived from the 2011 MCT model and used to set the MTRs of the four largest MCPs) to be a good starting point for bilateral negotiations when smaller MCPs seek to establish a fair and reasonable MTR. Consequently, we would generally have expected that the MTRs set by smaller MCPs such as [✂] to have reduced in line with the benchmark MTR such as to now be at the previous estimate of LRIC. Additionally, we note that symmetric MTRs (i.e. set at the same level between MCPs) would be in line with the 2009 EC Recommendation.

8.89 As explained in Section 6, [✂] have also argued that that their efficiently incurred costs are higher than those incurred by the four largest MCPs as a result of providing services such as international call forwarding.

8.90 We recognise that the overall costs of providing international services, such as call forwarding over UK mobile number ranges, might exceed the efficient costs used to calculate our benchmark MTR. However, the costs associated with international conveyance/transit are not relevant to the costs incurred for the provision of MCT within the UK. Therefore, we expect the level of costs efficiently incurred by MCPs who terminate calls on UK mobile number ranges to be at most the level of the MTR cap.

8.91 Therefore, we do not believe that there is an objective reason for departing from symmetric MTRs. We also do not believe that calling parties should have to continue paying more than the benchmark MTR. Given the detrimental impact of asymmetric MTRs (discussed in Section 5), we believe that rates should be set on a symmetric basis as quickly as possible.

---

[376] All in 2012/13 prices.
[377] March 2011 Statement, paras. 6.32-6.37.
[378] Ofcom, *Wholesale mobile call termination: Guidance on dispute resolution in relation to fair and reasonable charges*, Statement, 5 April 2011 http://stakeholders.ofcom.org.uk/binaries/consultations/mtr/statement/guidance.pdf

Realisation of consumer benefits from change in MTRs

8.92 As discussed in Section 6, we believe that MTRs at LRIC will deliver more effective competition and ultimately be to the benefit of end consumers. Even if, as suggested by EE and Vodafone, there were delays in these benefits being passed through to end consumers, the sooner we set MTRs at LRIC, the sooner these benefits will be realised.

Asymmetric risk of charging below LRIC

8.93 Vodafone and EE have suggested that because of an asymmetric risk of setting MTRs below LRIC we should adopt a glide path.

8.94 We do not consider that the use of a glide path is an appropriate tool to address issues relating to potential asymmetric risk (which, as discussed in Section 6, we do not consider to be significant). This is because even if we were to adopt a glide path, we would still be capping MTRs at our estimate of LRIC in the final year of the charge control. Therefore, were our estimate of LRIC to be incorrect due to asymmetric risk (as EE and Vodafone argue), a glide path would not properly mitigate this risk.

8.95 If there were an asymmetry of risk, we consider that in principle this would be better addressed in the choice of cost standard used to set MTRs (as opposed to a decision on whether to adopt a glide path). In Section 6 we explain that we do not accept that MTRs below LRIC, to the extent that could occur through modelling error, would have a greater adverse impact on efficiency, competition or distributional effects than MTRs the same amount above LRIC.

Comments by the European Commission

8.96 On 5 March 2015, we received from the EC its Decision letter concerning Case UK/2015/1706 in respect of our notified proposals. We received no responses from BEREC or the other NRAs. The EC did not object to our notified proposal to set MTRs at the new LRIC rate at the start of the second year of the charge control (i.e. from 1 April 2016), with a partial adjustment towards the new LRIC rate in the first year of the charge control (i.e. in 2015/16).

8.97 However, the EC considered that delaying the adaptation of rates to reductions in underlying costs does not allow efficiency gains to be passed on to operators purchasing termination services and ultimately consumers. While the EC acknowledged the decrease in MTRs was substantial, it considered that, even if the magnitude of the reduction would have been difficult for operators to foresee, the overall downward trend could have been anticipated by the industry. Given Ofcom's own conclusion that the MTRs should be implemented as soon as possible for the benefit of competition, it asked Ofcom to reconsider the need for a one-year adjustment period and to implement the revised rates as soon as administratively possible.

Conclusion

8.98 We consider that given the overall benefits of setting MTRs at LRIC for competition and ultimately consumers, MTRs should be set at LRIC as quickly as is reasonable and proportionate whilst allowing sufficient time for MCPs and ultimately consumers to adjust.

8.99 Based on responses to the June 2014 Consultation and additional evidence we have collected, we have performed a further assessment of the impact on MCPs of an immediate reduction in MTRs to LRIC. Based on this assessment we consider that although the impact that would result from MTRs being reduced to LRIC immediately remains relatively modest, the net revenue impact is higher than our estimate in the June 2014 Consultation. We also recognise the short-term constraints faced by MCPs when adjusting their retail prices, such that it may be more difficult for them to rebalance retail prices to recover efficiently incurred costs. There may also be a risk of any price increases being concentrated on certain customer segments – e.g. pre-pay – or disproportionately concentrated on certain charges (e.g. particular out-of-bundle charges for post-pay contracts).

8.100 We have considered the benefits of moving to the new LRIC rate quickly as well as the need to allow MCPs the opportunity to recover their efficiently incurred costs and minimise the risk of disruption to mobile consumers. On balance, we consider it appropriate to set MTRs at the new LRIC rate at the start of the second year of the charge control (i.e. from 1 April 2016), with a partial adjustment towards the new LRIC rate in the first year of the charge control (i.e. in 2015/16). We do not consider it appropriate to adopt a two-year glide path as the risk to efficient cost recovery as a result of the short-term constraints faced by MCPs when adjusting their retail prices is sufficiently mitigated after a year. We have concluded that a two-year glide path would therefore unduly delay the overall benefits of setting MTRs at LRIC for competition and consumers.

8.101 We have given careful consideration to the comments received from the European Commission on 5 March 2015. While we recognise the benefits of moving to the new LRIC rate quickly, we have also considered the short-term constraints faced by MCPs when adjusting their retail prices and the need to allow MCPs the opportunity to recover their efficiently incurred costs. Therefore, on balance, we continue to consider it appropriate to set MTRs at the new LRIC rate at the start of the second year of the charge control (i.e. from 1 April 2016), with a partial adjustment towards the new LRIC rate in the first year of the charge control (i.e. in 2015/16).

Transition period

8.102 Since this statement is issued less than 28 days (i.e. the current regulatory notice period on the currently regulated MCPs) before the end of the current charge control we have considered whether it would be appropriate to allow for a transition period before MTRs are set at the levels determined in the new charge control. We consider, in particular, that in setting new MTRs, MCPs and CPs will need to make changes in their wholesale rates and implement those changes (including changes to billing and software systems) as well as notifying interconnecting CPs with sufficient time. We note that wholesale billing cycles generally run from the start of each month.

8.103 In addition, nearly all MCPs interconnect with BT. BT's Charge Change Manual, states that in the event that changes to wholesale prices require changes to retail prices, BT needs 56 days to implement such changes.[379] However, these timescales are specific to BT and are not a regulatory requirement on MCPs with SMP in MCT.

[379] BT/Operator Charge Change Manual, 25 February 2010, BT Wholesale https://www.btwholesale.com/pages/static/Pricing_and_Contracts/Reference_Offers/Telephony.html

8.104 In order to facilitate implementation of the new MTRs, we have decided to adopt a transition period for the introduction of the new caps. Given the publication date of our final statement, we consider that a transition period until 1 May 2015 will allow a sufficient period of time for the relevant changes to be made and notified to other CPs.

8.105 As noted in Section 5, the new charge control condition will apply from 1 April 2015 for the four largest MCPs and from 1 May 2015 for smaller MCPs (in consideration of the fact that the latter are not currently subject to a charge control). In relation to the charge control condition for the four largest MCPs, we have decided to allow a transition period until 1 May 2015, during which time we require the four largest MCPs to charge no more than the currently prevailing cap (i.e. that set for the period 1 April 2014 to 31 March 2015 which is 0.845ppm. From 1 May 2015, the reduced MTR cap (to 0.680ppm) will take effect for all MCPs designated as having SMP, including smaller MCPs.

8.106 This approach will allow all MCPs to provide at least 28 days notification of changes to their MTRs thereby ensuring consistency with the notice period set out in SMP condition M4 and also gives MCPs and CPs 44 days to take the necessary internal steps to implement the new MTRs or changes in other prices as a result of the new MTRs.

Legal tests

8.107 Section 87(9)(a) of the Act authorises the setting of an SMP condition imposing charge controls in relation to matters connected with the provision of network access. Section 88(1) of the Act authorises the setting of an SMP condition falling within section 87(9) where it appears to us that there is a relevant risk of adverse effects arising from price distortion and it also appears to us that the setting of the condition is appropriate for the purposes of:

- promoting efficiency;
- promoting sustainable competition; and
- conferring the greatest possible benefits on the end-users of public electronic communication services (PECS).

8.108 As discussed in Section 4, based on our market analysis we consider that there is a relevant risk of adverse effects arising from price distortion as, absent regulation, MCPs would have the ability and incentive to set excessive MTRs.

8.109 We consider that the charge control condition is appropriate for promoting efficiency as it addresses the inefficient structure of charges that results from excessive MTRs. Setting MTRs at LRIC encourages efficient consumption of services. We note, in this respect, that Vodafone argued that we should adopt a conservative approach in setting the MCT charge control on the grounds that all price control remedies must provide for the expectation of the recovery of efficiently incurred cost and that, in its opinion, there is no margin for error provided for in the Common Regulatory Framework for under-recovery. For the avoidance of doubt, the charge controls that we have decided to impose are based on the relevant costs that we consider would be incurred by an average efficient operator. By targeting the average efficient operator, our regulation of MTRs allows MCPs the opportunity to recover the costs of providing MCT, including the cost of capital on those investments. We consider that our approach is consistent with the Common Regulatory Framework (in particular,

Art. 13 of the Access Directive) because using the costs of an average efficient operator as a basis for setting the charge control ensures that the charge control serves to promote efficient and sustainable competition. This is also in line with the 2009 EC Recommendation.

8.110 We consider that the charge control condition is appropriate for the purposes of promoting sustainable competition as it seeks to address the distortions of competition which arise from excessive MTRs. In particular, we consider that a LRIC MTR best promotes sustainable competition, as it will intensify competition among MCPs, and reduce the competitive impact of the difference between MTRs and FTRs.

8.111 We consider that the charge control condition is appropriate for the purpose of conferring the greatest possible benefits on end-users of PECS. We consider that consumer benefit is maximised by our choice of a LRIC MTR.

8.112 We have taken account of the extent of investment by MCPs, as required by section 88(2) of the Act. In designing the charge control, we have taken into account the reasonable rates of return on investment required by an average efficient MCP. We consider that MCPs will continue to have the ability and incentive to invest, following the imposition of the charge control in SMP Condition M3.

8.113 We consider that this charge control condition meets the criteria set out in section 47 of the Act because it is:

i) Objectively justifiable, in that it is aimed at ensuring that MCT services are provided by MCPs at a price level that will secure efficient and sustainable competition and maximise consumer benefits. As explained in Section 5, we consider it appropriate to impose a charge control on all MCPs (regardless of their retail scale) as we consider that, on balance, this approach would be more effective at remedying the harm that would be caused by excessive MTRs than if some MCPs were not subject to this SMP condition;

ii) Not unduly discriminatory, in that it applies equally to all designated MCPs;

iii) Proportionate, because it is the least restrictive means to address the concerns set out earlier in relation to the harm arising from MCPs' ability and incentives to charge MTRs that are above cost. As explained in Section 5, whilst we recognise that a charge control is arguably a more intrusive remedy than an obligation to ensure MTRs are fair and reasonable, we consider that, in terms of compliance costs, a simple charge control of the type we envisage (i.e. a charge control that sets a flat rate cap but does not impose additional obligations such as periodic compliance calculation and reporting) would not be more burdensome. We also consider that it is proportionate to apply a charge control to the smaller MCPs having regard to the fact that we consider it would be more effective at remedying the harm caused by excessive MTRs; and

iv) Transparent, in that the condition is transparent in its operation and has been accompanied (in this document) by an explanation of its intended operation and effect. We have set out a transparent explanation of the operation and objectives of the charge control condition. Moreover, the form of the charge control (a maximum charge ceiling) is itself transparent and maintains the simple mechanism set by our 2011 MCT Statement. We consider that the simple charge control supports the proportionality and transparency of the condition.

8.114 We have carefully considered our duties under Section 3 of the Act. We consider that the imposition of the charge control condition is consistent with our primary duty to further the interests of citizens and to further the interests of consumers, where appropriate by promoting competition. We have had regard, in particular, to the interests of those consumers in respect of choice, price, quality of service and value for money. Of the prescribed statutory objectives in section 3(2) of the Act, we consider that securing the availability throughout the UK of a wide range of electronic communication services is particularly relevant to this review.

8.115 As discussed in Section 6, we have assessed the impact on consumers of basing a charge control on a LRIC cost standard, in terms of ownership, pricing and use of communications services.

8.116 We have also considered our other duties under section 3 of the Act, particularly the obligation to have regard to the needs of the disabled, the elderly and those on low incomes (section 3(4)(i) of the Act). In Section 6, we have given careful consideration to the distributional impacts of imposing a charge control based on LRIC and we consider that vulnerable customers are unlikely to be significantly affected under LRIC MTRs, relative to LRIC+. In Annex 6, we have considered the impact on the disabled and elderly of imposing a charge control and based on the available evidence, we do not believe that either group would face a material negative impact from our decision to impose a charge control on MCT.

8.117 In Section 5 and Section 6, we have also taken into account our other duties under section 3(4) of the Act as relevant, e.g. in particular the desirability of promoting competition in relevant markets and the desirability of encouraging investment and innovation.

8.118 Finally, we have acted in accordance with the six European Community requirements set out in section 4 of the Act. Of particular relevance to this decision are the requirements to promote competition in the provision of electronic communications networks and services, to take account of the desirability of acting in a technologically neutral manner, to promote the interests of all persons who are EU citizens, and to encourage the provision of network access for the purpose of securing efficient and sustainable competition and the maximum benefit for customers of communication providers. We have explained above that we consider the charge control condition (and our choice of a LRIC cap on MTRs) to be appropriate and proportionate for end-users. In seeking to maximise consumer benefit, we also consider that we are promoting the interests of EU citizens. We have also considered the needs of specific social groups of consumers and consider that our conclusions do not result in significant equity concerns. In our design of the charge control, and by imposing a charge control ceiling on all MCPs, we have taken into account the desirability of acting in a technologically neutral manner.