Wholesale mobile voice call termination

Statement

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✂ indicates passages that have been redacted

Annex 3

Publication date: 15 March 2011

Annex 3

Economic arguments on pure LRIC versus LRIC+

Introduction

A3.1 This annex discusses in detail a number of economic arguments on the relative merits of adopting either pure LRIC or LRIC+ as well as covering proposals raised by stakeholders around two-part wholesale charges for MCT. In this Annex 3 we address the economic arguments for pure LRIC and LRIC+ in terms of efficiency, competition and distributional effects,[1] and respond to the submissions made in response to our April 2010 consultation and November 2010 consultation, while section 8 contains our overall assessment and our conclusions.

A3.2 These three grounds are further subdivided, to consider:

3.2.1 In relation to efficiency:

a) Allocative efficiency; and

b) Dynamic efficiency;

3.2.2 In relation to the effect on competition:

c) Competition amongst MCPs – further split into a discussion of how MTR pricing affects the difference between on- and off-net mobile-to-mobile retail prices; market-wide competition effects and the question of whether MTRs may create barriers to expansion for MCPs with fewer subscribers; and

d) Competition between MCPs and FCPs.

3.2.3 In relation to impacts on consumers (distributional effects).

A3.3 With respect to each criterion, we set out:

3.3.1 Our preliminary view, as set out in the April 2010 consultation;

3.3.2 A summary of the points made in submissions;

3.3.3 Our detailed analysis in light of those points; and

3.3.4 Our conclusions on the various considerations.

A3.4 One of the three issues dealt with under 'Competition' (barriers to expansion for MCPs with fewer subscribers) was the subject of our November 2010 consultation, and so we also set out, prior to our conclusions, our preliminary views in that consultation and our analysis of points made in responses to it.

[1] In this Annex we do not expand upon the fourth of our assessment criteria identified in section 8 (i.e. commercial and regulatory consequences) as this criterion is already discussed in full in that Section. There are also a number of legal arguments in section 8 that are not expanded here so this Annex needs to be read in conjunction with section 8.

Economic efficiency

Allocative efficiency

April 2010 consultation

A3.5 In our April 2010 consultation,[2] we discussed how adopting LRIC+ and pure LRIC may affect allocative efficiency. We considered the level of MTRs less critical to productive efficiency.[3]

A3.6 We noted that a MCP's fixed and common costs can be recovered from either incoming calls through MTRs (with some fixed and common costs being allocated under LRIC+), from other wholesale charges, from their own retail subscribers or from a combination of these charges.

A3.7 We argued that the structure of regulated MCT charges needed to be a practical solution. While some options considered in our May 2009 consultation, such as CBC, had certain desirable properties, we noted that there seemed to be issues over its practicability and little appetite apparent among industry players to address these practical obstacles. We considered the only practical alternative wholesale pricing structure for MTRs was a linear (ppm) charge.

A3.8 Thereafter, the focus of our April 2010 consultation was around how best to determine the appropriate contribution to fixed and common costs (the size of the mark-up, if any, over incremental costs) within a 'pence per minute' charging structure. The critical question was: is it more efficient to recover common costs from termination revenue using a linear mark-up on MTRs as it is currently done (i.e. on top of the pure LRIC level) or from retail revenue?

A3.9 We thought that it was difficult to choose between the two in terms of allocative efficiency alone:

- A Ramsey pricing rule would suggest that more common costs should be allocated to less elastic services, so it might be appropriate to allocate at least some common costs to wholesale termination if they were indeed less than perfectly elastic (though determining the proportion allocated remains unclear and subject to a substantial risk of regulatory error);

- The variety of mobile retail tariffs currently available in the UK is evidence of widespread retail price discrimination.[4] This suggests that it may be more efficient to recover common costs from the retail side of the market rather than from wholesale services.

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[2] Paragraphs A12.25 to A12.79 of our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/annexes/wmvct_annexes.pdf.

[3] Allocative efficiency is achieved when the value consumers place on a good or service (reflected in the price they are willing to pay) equals the cost of the resources used up in production (in particular prices are aligned to marginal or incremental costs). We focus on allocative efficiency as the level of MTR is not that critical for productive efficiency given that origination and termination are jointly produced and that as long as there is sufficient competition in origination, MCPs have the right incentives to minimise costs for both service elements.

[4] Bill Monitor (a price comparison service accredited by Ofcom) estimates there are more than 14,500 price plans available to UK consumers (and over 7.9m if one were to include handset and tariff combinations). See http://www.billmonitor.com/.

- LRIC+ based on ppm charging as in the 2007-2011 charge control may poorly reflect the underlying cost structure of MCT. For instance, taking coverage as given, in the short-run at least, costs are driven by the capacity required to provide the service and not by minutes of traffic. LRIC+ based on ppm charging as in the 2007-2011 charge control may, therefore, lead to wholesale termination and retail origination rates that do not properly reflect the underlying cost drivers.

A3.10 In our April 2010 consultation, we concluded that the choice was essentially between options that already depart from a theoretical “first-best” solution.[5] On the basis of the available evidence it was difficult to determine whether either of the two cost standards should be preferred on allocative efficiency grounds. We indicated that we could not be certain that pure LRIC would optimise allocative efficiency as price discrimination at the retail level may not be perfect. Neither did we consider LRIC + to be fully optimal as the arguments suggested that it would only be efficient to recover a limited amount of common costs from MTRs.

Stakeholder responses

A3.11 Allocative efficiency had already been considered by us in (and by stakeholders in submissions responding to) our May 2009 consultation, and that discussion informed our analysis in the April 2010 consultation. Here we focus mainly on the new arguments that have emerged in the responses to our April 2010 consultation.

A3.12 EE,[6] O2[7] and Vodafone[8] submitted that we had provided limited evidence that pure LRIC led to more efficient outcomes. O2 argued that we had not provided evidence that the balance of retail and wholesale tariffs that we observe in the market was not already allocatively efficient.

A3.13 Most of the respondents in favour of pure LRIC tended to focus upon overall consumer benefits (i.e. greater numbers of calls to and from mobiles) as a better measure of increased consumer welfare.

A3.14 We have grouped the arguments emerging from the consultation under five headings:

- Conceptual arguments (including structure of charges);
- Retail price flexibility;
- Externalities;
- Impact on mobile usage and ownership; and
- Impact on the fixed sector.

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[5] A conceptual, but not practical or viable, first best option is to have the common costs recovered via government subsidy financed via a non-distortionary tax.
[6] Paragraphs 63 to 67 of EE’s response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Everything_Everywhere.pdf.
[7] Paragraph 106 of O2’s response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/O2.pdf.
[8] Second bullet point on page 5 of Vodafone’s response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Vodafone.pdf.

Conceptual arguments (Ramsey pricing and capacity based charging)

A3.15 O2 submitted[9] that we had found that Ramsey pricing principles were best served by LRIC+, as demonstrated by our previous MCT charge control decisions and comments on the draft EC Recommendation. O2 submitted[10] that the case for moving to pure LRIC would have to be based on voice termination services being perfectly elastic - but it considered that there was no evidence to support this. O2 submitted[11] that it was not wishing to re-open the debate over the full adoption of Ramsey pricing (for example, setting MTRs using measured price elasticity data). Nonetheless, it argued that LRIC+ would be more proportionate in that it would allow at least some recovery of common costs, even if this reflected technical capacity requirements (through routing factors), rather than economic principles.[12]

A3.16 O2 submitted[13] that we had not addressed its criticisms of pure LRIC made in response to the May 2009 consultation: that pure LRIC results in an unfair cross subsidy of call originators (which we assume it meant that mobile consumers (through higher retail prices) would cross subsidise the fixed users as fixed callers enjoy the benefits of mobile coverage without paying for it). It argued that this effect led to higher, less efficient prices for other mobile retail services; and that pure LRIC would force MTRs below the 'competitive' level, which is unsustainable.[14]

A3.17 EE submitted that we accepted the economic reasoning in support of Ramsey pricing on the basis of efficiency in previous decisions. It argued that we previously chose not to apply it largely because of implementation difficulties, but it argued that our adoption of the LRIC+ cost standard took account of efficient pricing principles and was put forward as striking "*a balance between relevant principles of efficient pricing and practicality*".[15] EE also noted[16] that Oftel previously acknowledged that termination should make a relatively large contribution to common cost recovery. EE submitted[17] that we were now proposing a major departure from our previous

[9] Paragraph 80 of O2's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/O2.pdf.
[10] Paragraph 79 of O2's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/O2.pdf.
[11] Paragraph 77 of O2's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/O2.pdf.
[12] We consider that O2 did not want to re-open the debate on Ramsey pricing on the basis that previous judgments have ruled it out, including in particular on practicality grounds. For example, the CC's 2002 determination on mobile call termination concluded there are "*there are formidable problems associated with computing correct Ramsey prices*." (paragraph 1.4, page 6 at http://www.competition-commission.org.uk/rep_pub/reports/2003/475mobilephones.htm). In addition, Annex 17 of our 2007 MCT statement (http://stakeholders.ofcom.org.uk/binaries/consultations/mobile_call_term/statement/statement.pdf). considered and rejected the use of Ramsey pricing as the basis for setting MTRs.
[13] Footnote 3, page 6 of O2's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/O2.pdf.
[14] In O2's response to our May 2009 consultation (paragraph 50 at http://stakeholders.ofcom.org.uk/binaries/consultations/mobilecallterm/responses/Telefonica_02_UK_Limited.pdf), it submitted that in competitive markets, prices cannot be less than marginal costs (save for the very short term) and would be likely to be higher, making some contribution to common and fixed costs in particular to ensure that the provision of such services is sustainable over the long run.
[15] Paragraph 91 of EE's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Everything_Everywhere.pdf,.
[16] Paragraph 94 of EE's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Everything_Everywhere.pdf.
[17] Paragraph 64 of EE's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Everything_Everywhere.pdf.

positions, even though the fundamental nature of mobile demand has not changed. EE also disagreed[18] with the statement in our April 2010 consultation that the key question was whether it was more efficient to recover common costs from a linear markup on MTRs or from retail services where MCPs have more pricing flexibility. EE argued that the key question was whether it was more efficient to recover common costs across the full range of services (including MTRs) or only from a subset of services (i.e. retail services). EE further argued that economic theory unambiguously suggested recovery across the full range of services (unless demand is perfectly elastic).

A3.18 BT saw[19] Ramsey pricing as an "academic" principle with limited practical application as retail prices are non-linear. It also noted that MCPs arguing to retain their ability to recover greater costs from termination were essentially arguing for an ability to exploit monopoly power when selling services to their competitors. BT was also concerned that discussion of Ramsey pricing rarely acknowledged the reality of competition between mobile and fixed CPs and the impact of mobile pricing on that competition. BT also argued that in any case Ramsey pricing was simply not compatible with the 2009 EC Recommendation.

A3.19 In H3G's further submission,[20] H3G considered that pure LRIC is a more efficient and more realistic basis for setting MTRs, because it does not force a set of prices into an inefficient and unrealistic linear pricing structure, which in its view was clearly inconsistent with both the theory and evidence of efficient pricing structures seen in retail markets. It noted that the lack of linear pricing in the retail market invalidated the use of Ramsey pricing arguments in favour of LRIC+ over pure LRIC, because such arguments were based on a standard Ramsey model under which operators are constrained to charge linear prices for the different services. In its view, in the presence of non-linear pricing, the conclusions of the standard Ramsey model no longer applied. H3G noted that we acknowledged this in our 2007 MCT statement.

A3.20 Three respondents to our April 2010 consultation engaged further with the question of CBC, and one further party expressed a view after discussion within the industry (i.e. not in its formal response to our April 2010 consultation).

A3.21 EE stated that both T-Mobile and Orange (the formerly separate MCPs now merged under the EE brand) had *"...previously noted the potential for significant efficiency gains from CBC but that there [sic.] significant implementation issues."*[21] EE argued that CBC could allow for the recovery of fixed and common costs and *"...avoid the serious risks associated with Ofcom's proposal to shift recovery of all these cost on to only one side of the market."*[22] EE further argued *"...that Ofcom should use the next two years to coordinate a mobile and fixed industry working group to*

[18] Paragraph 88 of EE's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Everything_Everywhere.pdf.
[19] Page 16 of BT's response, to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/BT.pdf.
[20] Paragraph 30 of H3G's response to other operator comments at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/three.pdf.
[21] Paragraph 252 of EE's response, to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Everything_Everywhere.pdf
[22] Paragraph 254 of EE's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Everything_Everywhere.pdf

investigate the likely gains that could be achieved by CBC in practice and a plan to address the implementation issues."[23]

A3.22 Vodafone noted that CBC for interconnection had *"...been discussed in the UK for nearly 20 years without reaching any clear path forward"* but went on to note that *"...the potential exists to make progress on this matter and that some form of two-part charging as a proxy for CBC can be introduced for mobile and fixed operators during the lifetime of the next price cap."* [24] Vodafone proposed setting a two-part charge in which the variable component was set on the basis of pure LRIC (in ppm terms) and the fixed component would be calculated by reference to the difference between pure LRIC and LRIC+ and where the £m quantum was then recovered over the number of required E1 links.[25] Using our April 2010 cost model Vodafone estimated the fixed charge at £44k p.a. in 2014/15 (in 2008/09 prices) and using its modifications to the April 2010 cost model, at £87k p.a.[26]

A3.23 Vodafone considered a two-part charging regime as inferior to a ppm LRIC+ basis for MTRs because it could break the link between the MTR and the customer lifetime value.[27] In respect of the practical issues around CBC,[28] Vodafone did not consider these to be so intractable as to undermine the case for its implementation. It highlighted a number of implementation issues associated with CBC and made submissions that a number of issues (noted below) were either not a concern or could be readily resolved:

3.23.1 Forecasting demand for capacity;

3.23.2 Risk of fixed charges acting as a deterrent to small CPs interconnecting;

3.23.3 Inter-play between voice termination traffic and other traffic using shared links;

3.23.4 Industry does not necessarily have incentives to cooperate over implementation;

3.23.5 Monitoring of capacity usage may be required;

3.23.6 The risk of setting capacity charges too low;

3.23.7 Ofcom would still need to set charges at a cost-based level;

3.23.8 Consistency between fixed and mobile termination regulation; Treatment of transit traffic; Impact on physical arrangements for interconnection and routing strategies;

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[23] Paragraph 257 of EE's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Everything_Everywhere.pdf.
[24] Page 63 of Vodafone's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Vodafone.pdf.
[25] An E1 link is a 2 Mbit/s circuit used for direct interconnection of TDM networks.
[26] Page 64 of Vodafone's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Everything_Everywhere.pdf
[27] Under ppm LRIC+ for MTRs the terminating traffic to a given subscriber will always allow for a contribution to common costs. With a two-part charge, if a customer's inbound calling profile does not increase the demand for interconnect links there will not be a contribution to common costs under Vodafone's two-part wholesale tariff.
[28] Page 62 to 68 of Vodafone's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Everything_Everywhere.pdf

3.23.9 Determining whether capacity should be pre-booked or based on actual usage;

3.23.10 Non-coincidental peaks for different originating networks;

3.23.11 Shifting peaks; and

3.23.12 Implementation costs.

A3.24 O2 argued that if Ofcom was concerned over MTRs being set as linear charges, the appropriate solution was not forcing common cost recovery away from termination, but to introduce CBC.[29] O2 acknowledged that there had been little enthusiasm to develop CBC for commercial purposes, but argued that *"...if Ofcom can demonstrate that a move to non linear wholesale charging would produce allocative efficiency gains [...], it is incumbent on Ofcom to introduce capacity based charging via regulation"* (Emphasis in original).[30]

A3.25 O2 then proposed a form of two-part tariff in much the same form as Vodafone's suggestion noted above.[31] O2 estimated that the fixed charge per E1 p.a. would be approximately £40,000 in 2011 – i.e. of very similar magnitude to that calculated by Vodafone using the April 2010 cost model (although Vodafone reported the figure for 2014/15 rather than 2011).

A3.26 O2 went on to note that it would take time to develop CBC in the UK as all CPs, not just MCPs, would need to adjust to the new regime. O2 further advocated LRIC+ based MTRs for the intervening period.[32] In O2's view this would allow Ofcom to consult on the move to CBC for both FTRs and MTRs on the same timeframe – as the controls on BT's FTR (under the network charge control (NCC)) expire in September 2013. O2 noted the issue of transit pricing but argued that the market would take care of this and in so far as BT acted as transit operator of last resort, there was *"...ample time before 30 September 2013 to agree the appropriate regulatory approach in that regard."*[33]

A3.27 H3G, on the other hand, was less keen on CBC as an alternative to pure LRIC. From correspondence between MCPs just before closure of the April 2010 consultation period, it appears that Vodafone was engaging with other CPs on how industry might adopt and implement a two-part charging model. However, H3G did not consider that it was something it would support in terms of the next charge control period and in so far as industry was going to engage with an alternative charging regime, H3G favoured bill and keep.[34]

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[29] Paragraph 109 of O2's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/O2.pdf
[30] Paragraph 110 of O2's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/O2.pdf.
[31] Paragraphs 113-116 of O2's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/O2.pdf.
[32] Paragraph 117 to 118 of O2's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/O2.pdf.
[33] Paragraph 122 of O2's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/O2.pdf.
[34] E-mail reply from H3G (of 24 June 2010) to Vodafone's e-mail (of 17 June 2010), copied to Ofcom on 25 June 2010.

Retail price flexibility

A3.28 EE noted[35] that our April 2010 consultation focused on the ability of MCPs to price discriminate on the retail side as if it were something new and something that represented an alternative framework to the principles of Ramsey pricing. The fact that MCPs offered a range of different mobile tariffs was not new and it should be noted that the bulk of UK consumers (and most likely the bulk of marginal consumers) were on a handful of pre-pay tariffs for which MCPs had very limited information or ability to price discriminate between consumer types. EE argued[36] that, if anything, forcing a greater proportion of cost recovery onto retail markets would be likely to reduce rather than increase price flexibility.

A3.29 O2 submitted that one of Ofcom's main arguments for pure LRIC was that MCPs could engage in extensive price discrimination at the retail level, which may be more efficient than recovery from a linear mark-up on MTRs. It noted[37] however that the "retail price discrimination" point, which Ofcom now suggested was of such significance, did not even merit consideration in the 2007 MCT review.[38] Furthermore, it noted[39] that Ofcom had not presented evidence that the UK market has not already reached a state of allocative efficiency.

A3.30 O2 noted[40] that the reason why the retail market was relatively more flexible (in terms of the ability of MCPs to price discriminate) was because pricing in the wholesale market was constrained by regulation. It, therefore, considered that the case for pure LRIC was somewhat circular in that it relied upon a particular assumption over the form of wholesale regulation.

A3.31 It further argued that, even so, retail pricing itself was constrained by various regulatory measures[41] (e.g. service providers do not have retail price flexibility for international roaming charges and there was the potential for retail obligations in respect of NTS calls). O2 argued that at no stage had we sought to quantify whether there was a minimum number of pricing options required by a service provider in order for it to recover common costs effectively and efficiently. O2 also mentioned that there were MVNOs, such as ✂, that seek to attract consumers by offering very simple tariff packages. O2 submitted that as certain MVNOs make a virtue of simple tariffs, this limits alternative retail tariff structures available to such MVNOs. O2 therefore submitted that there would be no plausible way for such MVNOs to alter their retail tariff structures to recover lost termination revenues associated with lower MTRs.

[35] Paragraph 59 of EE's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Everything_Everywhere.pdf.
[36] Paragraph 79 of EE's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Everything_Everywhere.pdf.
[37] Paragraph 74 of O2's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/O2.pdf.
[38] In fact this was covered in the Ramsey pricing annex of the 2007 MCT statement. See paragraphs A17.23 to A17.31 at http://stakeholders.ofcom.org.uk/binaries/consultations/mobile_call_term/statement/statement.pdf.
[39] Paragraph 106 of O2's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/O2.pdf.
[40] Paragraph 81 of O2's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/O2.pdf.
[41] Paragraphs 87 to 89 of O2's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/O2.pdf.

A3.32 Vodafone also questioned[42] the MCPs' ability to engage in price discrimination to the degree suggested by Ofcom such that it could recover all its common costs from retail markets. It thought that it was questionable whether MCPs had the incentive to behave in this way. It provided an illustrative example of a MCP seeking to protect marginal consumers such as pre-pay via a higher subscription charge to its "infra-marginal" consumers. A MCP seeking to increase subscription charges in this manner would find that its "infra-marginal" consumers would be targeted by and switch to rival MCPs. Therefore this attempt would be unsuccessful because a MCP would never seek to fund reductions in incoming call revenues from one group of customers by increasing the retail prices faced by another group of customers because retail competition would make it unprofitable to do so.[43]

Externalities

A3.33 O2 submitted[44] that it was widely accepted that in two-sided markets the prices charged on the two sides need to reflect the presence of (cross-group) externalities between the two sides. Market outcomes are driven by respective demand elasticities and reflect each side's contribution to the other side's surplus. In the presence of cross-group externalities, overall mobile demand depends not only on the sum of prices, but also on the relative pricing structure and that this is efficient.

A3.34 O2 argued that in the context of two-way access (whether fixed or mobile termination) the cross-group externalities are translated through call externalities. O2 argued[45] that evidence of material call externalities was a necessary condition for below-cost pricing, or indeed a pricing structure that deviated from Ramsey-like recovery of costs and that Ofcom has recognised this on a number of occasions.

A3.35 EE agreed[46] with the reasons Ofcom had stated as to why call externalities were not relevant to the pricing of termination. It noted that market research undertaken for Orange in 2008 confirmed that most calls for pre-pay consumers were, on average, made within a relatively small circle of around ✂ consumers. EE argued[47] however that if Ofcom reduced MTRs to pure LRIC (with potential impacts on the number of subscribers on the network) then there was a case for reassessing the inclusion of a network externality surcharge (previously rejected by the CC in the 2007 MCT appeal) as such a mark-up could be critical for retaining low income, marginal, users on the network.

Impact on mobile usage and ownership

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[42] Pages 28-29 of Vodafone's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Everything_Everywhere.pdf.

[43] Vodafone noted that there was some support of this view in the findings of the 2003 MCT judicial review. In that judicial review, in relation to the application of the network externality surcharge, one of the findings was that the CC had failed to consider the low likelihood of operators directing any subsidies to marginal consumers only - because they had no commercial incentive to do so.

[44] Paragraph 75-76 of O2's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/O2.pdf.

[45] Paragraph 76 of O2's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/O2.pdf.

[46] Paragraph 67 of EE's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Everything_Everywhere.pdf.

[47] Paragraph 66 of EE's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Everything_Everywhere.pdf.

A3.36 Section 7 considered all the stakeholders responses on these issues and put forward our conclusions. This annex does not therefore address those responses further.

Impact on the fixed sector

A3.37 A number of MCPs argued that any reductions in MTRs will not result in lower retail prices for F2M calls and provided evidence in support of this argument (for more details on this see the discussion in section 7, paragraphs 7.182 to 7.198). Here we only refer to arguments made by stakeholders that may have some implication for the discussion of Ramsey pricing.

A3.38 EE also noted[48] that FCPs in recent years have passed through little, if any, of the reductions in MTRs into their retail F2M call prices. It argued that the smaller the degree of pass-through to retail consumers, the greater should be the recovery of common costs in termination charges because there was less of an impact on F2M demand from higher termination charges.

A3.39 EE further noted that we had previously argued that limited pass-through in F2M call prices may not be a problem because FCPs could have passed through savings from lower termination charges across a bundle of fixed services in a manner "*not inconsistent with efficient Ramsey pricing of fixed-line communications*." [49] As the demand for termination is ultimately a derived demand from retail calls to mobiles, and FCPs can price in a sophisticated way (i.e. pricing in relation to demand elasticities) this, EE argued, overturns Ofcom's perceived key benefit of pure LRIC.

Ofcom's analysis

A3.40 We had already discussed in detail a number of points raised regarding economic efficiency in our May 2009 consultation[50] and in our April 2010 consultation.[51] We therefore focus here on the new points raised in response to our proposed conclusions in the April 2010 consultation. The analysis in section 7 is also relevant to this discussion as it covers the stakeholders' arguments on the impact of pure LRIC on mobile and fixed usage and ownership.

A3.41 Consistent with the view we expressed in our April 2010 consultation, we do not believe that we can decide whether pure LRIC or LRIC+ is more efficient in terms of allocative efficiency solely on the basis of economic theory. Empirical evidence is important to give weight to the various theoretical arguments, and to seek to establish which of them is most likely to be relevant to the very specific characteristics of call termination markets.

A3.42 Adoption of pure LRIC would affect allocative efficiency because:

3.42.1 First, it implies lower MTR payments from the fixed to the mobile sector. For example, the annual reduction in payments from the fixed sector would

[48] Paragraph 65 of EE's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Everything_Everywhere.pdf.
[49] Paragraph 65 of EE's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Everything_Everywhere.pdf.
[50] See paragraphs 6.96 to 6.119 at http://stakeholders.ofcom.org.uk/binaries/consultations/mobilecallterm/summary/mobile_call_term.pdf.
[51] See paragraphs A12.19 to A12.85 at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/annexes/wmvct_annexes.pdf.

be £0.2bn in 2014/15 based on MTRs at pure LRIC rather than LRIC+.[52] Although as set out in Section 10, the profit impact of such a revenue reduction is likely be significantly less – given the strength of the waterbed effect and likely scale of cost reduction over the period to 2014/15.) It is not clear how MCPs will react to that, but we believe that at least some of it will likely take the form of higher fixed charges for subscribers with a lower elasticity for subscriptions (such as post pay users). This may have some effects on mobile subscriptions and/or usage.

3.42.2 Second, FCPs experience the opposite effect as they will no longer have to contribute to the recovery of mobile common costs through MTRs.

3.42.3 Third, the reduction in MTRs will lower the price floor for off-net M2M calls. This would likely reduce retail prices and potentially have an impact on usage.

A3.43 It seems likely that mobile charges may increase overall (or decrease less than would otherwise be the case with decreasing network costs), due to the reduced transfer from FCPs. However, the structure of mobile retail charges is also likely to change. Fixed (e.g. monthly) charges may increase but reduced MTRs for off-net M2M calls will, we expect, lead to lower call prices.[53] Importantly, as discussed further at paragraphs A3.264 to A3.320, not all consumers will be affected in the same way or to the same extent.

A3.44 As identified by Ofcom and stakeholders the combination of these changes could potentially have an impact on mobile ownership and usage. In Section 7 we have considered in detail the impact of the likely changes in prices on usage and ownership and we have concluded that the impact of a switch to pure LRIC from LRIC+ is unlikely to have a significant impact on either measures of output (i.e. ownership and usage) because of the limited difference between MTRs on either cost standard.

Conceptual arguments (Ramsey pricing and capacity based charging)

A3.45 Vodafone, EE and O2 disagreed that the choice between LRIC+ and pure LRIC was finely balanced. They argued that economic theory unambiguously points to the recovery of common costs from termination unless the demand for MCT is perfectly elastic. We consider that abstracting from competition considerations (discussed later in this annex), it is possible that pure LRIC would allow too little common cost recovery from termination compared to what would be optimal. At the same time LRIC+ as historically implemented in the UK may allow too much common cost recovery from MTRs. Therefore abstracting from competition considerations, we consider that there could be a *theoretically optimal* level of common cost recovery from termination which sits between pure LRIC and LRIC+ (with the "+" in LRIC+ determined by the MCT cost model), and which would be set according to Ramsey pricing principles. From a purely allocative efficiency perspective, two vitally important issues are whether it is practical to implement Ramsey pricing and, critically, the risk of regulatory error.

[52] Assuming no change in the volume of F2M minutes between now and 2014/15.

[53] Recent empirical research by Genakos C, Valletti T, *Seesaw in the Air: Interconnection Regulation and the Structure of Mobile Tariffs,* Information Economics and Policy (forthcoming) - estimated a similar impact from past reductions of MTRs. http://www.sel.cam.ac.uk/Genakos/Genakos&Valletti_Seesaw%20in%20the%20Air(1).pdf.

A3.46 Consistent with the view reached in other proceedings, full application of Ramsey pricing is computationally very difficult and highly prone to regulatory error. Consistent with this most MCPs appear to accept that Ramsey-type pricing is not a realistic basis on which to set charge controls.[54] However, some MCPs argue that LRIC+ goes "with the grain" of Ramsey pricing and at least some mark-up over incremental costs should be made for termination services – as they consider them to be more price-inelastic. Hence, arguments about Ramsey pricing are central to some stakeholders' arguments for using LRIC+ as the closest proxy.

A3.47 The Ramsey pricing framework applied to utility regulation is typically focussed on setting optimal prices for a multi-product monopoly firm so as to recover its common and fixed costs. The Ramsey pricing principle states that a multi-product monopoly should recover a larger proportion of the common costs (as a mark-up over marginal or incremental costs) from the least elastic of its services.[55] This well-known result is typically (but not necessarily) based on the assumption that the prices of all of the firm's services are set as linear charges.[56]

A3.48 However, mobile markets (including MCT) are not easily amenable to Ramsey pricing analysis:

3.48.1 First, while MTRs are set as linear prices this is not the case for retail tariffs where MCPs engage in substantial price discrimination (i.e. two- or multi-part charges).[57] When such non-linear pricing is possible, economic theory suggests that it may be more efficient to recover common costs via a usage invariant fee and charge usage fees that are set at marginal cost. While Ramsey pricing models can be adapted to accommodate non-linear pricing, this adds to the modelling complexity and the already significant informational burden for demand-side modelling is increased.

3.48.2 Second, MCT is not a service provided independently of retail mobile services - MTRs affect the retail pricing of competitors and, hence, the ability of MCPs to compete with one another. Therefore, the simple welfare analysis of monopoly regulation and the concerns of cost recovery do not apply in a straightforward manner to the regulation of termination. (The competition issues raised by MTRs above incremental cost are discussed further at paragraphs A3.103 to A3.263 below.)

3.48.3 Third, Ramsey charges are typically obtained under the assumption that all retail prices are determined by the regulator. In this case the regulator sets

[54] This is consistent with previous detailed review of this issue in the 2002 MCT enquiry. See for example Chapter 8 of Part II of the CC's report (Competition Commission, *Reports on references under section 13 of the Telecommunications Act 1984 on the charges made by Vodafone, O2, Orange and T-Mobile for terminating calls from fixed and mobile networks*,18 February 2003 at http://www.competition-commission.org.uk/rep_pub/reports/2003/fulltext/475c8.pdf).

[55] The Ramsey pricing rule is based on an inverse price elasticity rule whereby the least elastic service attracts the largest mark-ups and the most elastic service would attract the smallest mark-up. Such a rule might be relatively simple to apply to independent services (although determining the precise elasticities of each service is still subject to regulatory error), but this becomes far more complex when there are interdependencies in the demand for each service (i.e., in the presence of cross-price elasticities).

[56] For further explanation on Ramsey pricing rules, see Laffont, Jean-Jacques and Tirole, Jean, (1993), A Theory of Incentives in Procurement and Regulation, vol. 1, 1 ed., The MIT Press.

[57] For examples of multi-part and non-linear tariffs see paragraphs 25 and 26 of H3G's further response to our April 2010 consultation. http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/three.pdf

only one wholesale charge and the MCPs set all the other unregulated charges according to the firm-level demand elasticities they face rather than the industry-level elasticities for the different services.

A3.49 In our view, Ramsey pricing is not a viable option for setting MTRs. However, if we were to set to one side concerns about other economic criteria (such as competition), then rejection of Ramsey pricing does not rule out alternative mechanisms to recover common costs via wholesale charges on efficiency grounds. One such option, as recognised in the April 2010 consultation, was a CBC or two-part charges for MCT.

A3.50 On the issue of CBC or two-part charges for MCT, we remain of the view set out in our April 2010 consultation that *"...CBC may be an efficient structure for regulating MCT charges, but practical issues would make implementation disruptive and complicated."*[58] While it appears that Vodafone and O2 may have proposed what appears a straightforward form of two-part charging, it also appears that this is not the preferred alternative to pure LRIC for at least one party (H3G) since our April 2010 consultation. Further, many of the implementation issues identified by stakeholders in response to our May 2009 consultation remain – although we note that Vodafone's response, in particular, attempts to engage with why these would not be problematic. In order to explain the reservations we have with respect to CBC or two-part charging for this charge control period, we consider it useful to identify: first, some conceptual issues; and, second, some implementation issues associated with these alternative charging models.

A3.51 Conceptual issues to address before proposing a CBC or two-part charges framework for MCT are as follows:

3.51.1 **Defining the costs to be recovered:** CBC or, more generally, wholesale non-linear charging for MCT, relates to the structure of charges. Prior to determining the level of such charges, the quantum and type of costs to be recovered must be determined – essentially whether common costs are recovered, and if so by how much. For example, when non-capacity related costs (e.g. coverage or subscriber driven network costs) also arise a judgment must still be made as to whether the recovery of these non-capacity related costs via MCT charges is more efficient than recovery from the retail-side of the market and whether this is more efficient than MCT charging by some other (non-capacity based) metric.

3.51.2 **Defining the structure of charges and measuring capacity:** CBC and two-part charges are not the same concept (except in the special case that a pure CBC can be seen as a two-part tariff with a completely usage invariant fixed charge and a zero rated variable element). In theory, subject to the definition and measurement of capacity, CBC may provide a better alignment between the charges faced by originating networks and how costs arise. Two-part charges of the form suggested by Vodafone and O2 provide a compromise charging structure between how costs arise in the short-run and how costs arise in the long-run. For example, in the two-part tariff envisaged by Vodafone and O2, the measure of capacity – an E1 link – is itself only one measure of capacity and in the long-run will be driven by traffic, so is best seen as a short-run fixed charge. In addition, where the capacity related charge is also contributing to the non-capacity related

[58] Paragraph 7.19 of our April 2010 consultation, at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/summary/wmvct_consultation.pdf.

costs of mobile networks (e.g. coverage) then there is again a disconnect between how costs arise and how charges are set. Finally, the variable component in the two-part tariff suggested by Vodafone and O2 (i.e. the ppm pure LRIC rate), is likely to be a compromise between how the costs of capacity for termination arise. In the short-run if there is spare capacity, the per minute costs will be near zero (i.e. less than the pure LRIC), when at a capacity constraint, the short-run per minute cost will be very high and in excess of the pure LRIC (i.e. the cost of the additional circuits, radio access equipment and so on required to provide that last minute beyond the previous capacity available).

3.51.3 **Risk sharing:** Depending on the form of CBC, rules may be needed to address the risk that an originating network uses more than the pre-booked amount of capacity and/or that the terminating network fails to provide the requested capacity. Furthermore, the higher the fixed charge within a CBC or two-part tariff structure, the greater the volume risk borne by originating parties. Since this issue may have competition implications (though not exclusively) we discuss it under the next heading.

3.51.4 **Competition effects:** Vodafone has suggested that the fixed charge in its version of two-part charging is not *"...sufficiently large to deter smaller operators from directly interconnecting if this is efficient..."*[59] Clearly the size of the deterrence effect depends on the charging structure envisaged, the level of fixed charges actually set, the scale of entry and the extent of other fixed costs faced by entrants. However, in so far as the fixed charge involves a contribution above the capacity or traffic-driven costs directly associated with the subscribers of the entrant, then similar competition concerns arise to those discussed below (see paragraphs A3.123 to A3.263). That is, if retail call prices are reduced this will incentivise more off-net calling and an increase in costs beyond those incrementally caused by the traffic. The greater the risk of such calls going off-net, as might be expected for MCPs with smaller market shares, the more this will reduce the profitability of subscribers with a greater outbound to inbound usage pattern. While this effect may be more pronounced with LRIC+ MTRs set on a ppm basis, in the long-run (or over a sufficient scale of traffic), a similar effect will arise when the originating network spends more on interconnection than the directly related traffic-driven costs. For example, under the Vodafone and O2 proposals the fixed charge from which common costs are recovered is based on the number of E1 circuits – on which expenditure will increase as more traffic goes off-net.

A3.52 Examples of implementation difficulties include the following:

- **Industry co-ordination:** Given the diverging views expressed by MCPs and FCPs on the appropriate charging framework for MCT, the prospect of industry agreement seems limited. As suggested by O2, Ofcom could clearly impose CBC or two-part charges via regulation – rather than seek an industry-led solution. However, EE suggested that Ofcom should lead a joint industry working group, and on the basis of its findings, reassess the desirability of switching to CBC in 2 years,[60] O2 considered that the

[59] Page 66 of Vodafone's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Everything_Everywhere.pdf
[60] Page 64 of EE's response, to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Everything_Everywhere.pdf.

period to September 2013 (i.e. expiry of BT's NCC) would provide ample opportunity to consult on and agree the regulatory approach[61] and Vodafone considered that a solution could be introduced *"...without either significant operational difficulties or major disruption to the industry within the next 4 years."*[62] Given these timeframes, it can be seen that implementation of a CBC or two-part charging regime by 1 April 2011 would not have been realistic – noting that our consultation closed on 23 June 2010.

- **The interim period:** Given the timescales indicated above, if we were to try to implement CBC or two-part charges before the end of the charge control period, we would need to consider how MTRs were controlled in the intervening period. O2 suggested a LRIC+ based glide path for that period. While that would clearly avoid the risk of charges falling and then increasing, it would likely embed charges higher than ultimately preferred if the chosen cost standard was CBC set to recover only incremental costs. Moreover, there would then be the further complexity – and attendant risk of unintended consequences – from meshing together two charge control formulae within the same charge control period.

- **Competition and transit market effects:** The higher any fixed charge the more volume risk is borne by the originating operator. At one level this might be a concern since it increases the risks with entry – essentially exacerbating the scale risks associated with infrastructure-based entry. However, as Vodafone explains, it is possible that CPs which previously had direct interconnection might now favour the use of transit[63] – for example if fixed charges were reduced or eliminated from the termination charges passed on by transit operators to originating networks. While such mitigation of the costs of purchasing termination for smaller networks is a possibility, it is not inevitable that the transit market would necessarily work this way.

- **Billing systems:** Clearly a change to billing systems would be required to accommodate a move away from per minute billing. While this may not be complicated – since many aspects of telecoms interconnection and wholesale services involve non-linear charges – it will not be costless.

A3.53 This list is not exhaustive of all issues which would need to be addressed in drawing up an efficient and practicable CBC or two-part wholesale charging framework for MCT. It does, however, identify substantive questions on which divergent views are likely (some of which have already been revealed in response to our May 2009 consultation – as set out below). Resolving these within the period between the close of consultation and implementation of the new charge controls (a period of 9 months) would have been very difficult. We recognise that a longer more considered approach would be possible, but doing so in a way which might change the charge control mid-period is very undesirable as it raises regulatory uncertainty

[61] Page 120 and 122 of O2's response, to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/O2.pdf.
[62] Page 63 of Vodafone's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Everything_Everywhere.pdf.
[63] Page 67 of Vodafone's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Everything_Everywhere.pdf.

and introduces further implementation issues of its own (i.e. meshing together different charging mechanisms).

A3.54 Indeed, a number of responses to our May 2009 consultation (which is where we first asked respondents for their views on the relative merits of CBC against other charge control options) acknowledged these implementation issues. H3G submitted that:

"The implementation of such a fundamental shift (changing the structure as well as, potentially, the level of charges) as is represented by capacity based charging in the timescales of the current review would be risky and is likely to be unfeasible. A robust implementation would likely delay the implementation of any change with on-going and lasting damage to competition and therefore the interests of consumers."[64]

A3.55 In terms of implementation issues, H3G identified the following concerns over implementation:

- *"Changing the structure and level of charges would add another layer to the complications of deriving the right cost base and potentially delay the ability of the market review process to deliver benefits of a lower level of overall charges.*

- *The practical requirements of implementing such a radical change to the structure of wholesale charges will take a significant period of time. Operators would need time to be able to take account of such changes in the wholesale billing systems and to assess how changing the fundamental structure of wholesale charging might impact on retail pricing approaches. Relevant interconnect contracts would also need a fundamental re-working. This would require a long lead time and it is not clear what approach could be implemented in the meantime. Whichever way this was tackled, it would likely delay the delivery of benefits to consumers which can be achieved by reducing the overall level of wholesale charges.*

- *Having a different structure (as opposed to level) of charges between different communications sectors (e.g. mobile and fixed) and between different countries would further complicate the implementation challenges. Great care would need to be taken to ensure that competition was not distorted in other dimensions, that opportunities for arbitrage and fraud were not inadvertently created and that having such a different structure of wholesale charges did not create new and different barriers to competition between fixed and mobile and for emerging FMC style products. It may be that such barriers could not be overcome which would require such an approach to be more far reaching than the scope of the current market review (i.e. include the fixed sector as well), which would further increase the practical and process issues with implementing such an approach."*[65]

A3.56 Orange submitted that implementation issues were a major barrier to CBC:

[64] Section 3.3.4, page 31 of H3G's response to our May 2009 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/mobilecallterm/responses/Hutchison_3G_UK_Limited.pdf.

[65] Section 3.3.4, page 32 of H3G's response to our May 2009 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/mobilecallterm/responses/Hutchison_3G_UK_Limited.pdf.

"In general, we agree with Ofcom's analysis of CBC. CBC may be theoretically appealing but in practice we envisage that it will be difficult to implement and does not reflect the true value of mobile capacity relative to fixed capacity and the true value of voice relative to data. The use of network capacity for either voice or data is still at the developmental stage and it is too early to be able to accurately forecast changes in demand for capacity. For example, the recent rise in dongle usage has created unexpected capacity constraints. The creation of secondary markets in capacity would add an unnecessary layer of complexity and inefficiency at this point to a model which is simply about allocating a scarce resource (capacity) to it highest value usage. A capacity based charging model may be relevant in the future when known capacity availability and usage can be more clearly forecast. However, the costs of moving to a capacity based charging system would be high as all traffic would need to be measured and monitored by operators and Ofcom alike."[66]

A3.57 T-Mobile considered that CBC warranted further consideration but thought that:

"There are theoretical arguments both for and against a move to capacity-based charging, though there may also be serious practical difficulties in implementing this model that would need to be addressed before it could be implemented." [67]

A3.58 With respect to CBC, O2 submitted that:

"O2 does agree with Ofcom, […]*, when it says that CBC would be difficult to implement in practice. In our view, it should be left to operators to decide, commercially, whether or not to introduce this method of wholesale charging (we acknowledge the point made by Ofcom, that it would still be required to determine the level of charges)."*[68]

A3.59 Vodafone was more sanguine about the ability to implement CBC, but highlighted a number of implementation issues: *"This approach has theoretical merits but some implementation challenges. We think it is worthy of further study."*[69]

A3.60 In conclusion, we acknowledge that CBC and two-part charging may be attractive from an allocative efficiency perspective. However, we do not consider that the proposals received in response to our April 2010 consultation are an appropriate basis on which to regulate MCT for the period of this review – i.e. to 31 March 2015.

Retail price flexibility

A3.61 In principle, the ability to price discriminate more easily in the provision of retail services (relative to wholesale services) is an important argument in this discussion. While we recognise that the ability to price discriminate in wholesale termination

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[66] Page 10 of Orange's response to our May 2009 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/mobilecallterm/responses/Orange_Personal_Communicati.pdf,

[67] Page 3 of T-Mobile's response to our May 2009 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/mobilecallterm/responses/T_Mobile.pdf.

[68] Page 42 of O2's response to our May 2009 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/mobilecallterm/responses/Telefonica_02_UK_Limited.pdf,

[69] Page 37 of Vodafone's response to our May 2009 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/mobilecallterm/responses/Vodafone.pdf. See also pages 30-35, which includes a detailed discussion of the implementation issues associated with CBC. As noted above, Vodafone submitted in its response to the April 2010 consultation that a number of the practical implementation issues were either not a concern or could be readily resolved.

markets is currently restricted by regulation, the discussion (for example at paragraphs A3.50 to A3.52) highlights some of the complexities involved with allowing price discrimination (in the form of non-linear pricing) in the regulation of MCT. Moreover, it should be noted that termination is just one of many wholesale services offered by national MCPs. For example, national roaming for voice and data services are unregulated and these markets provide further opportunity for MCPs to price flexibly to contribute to the recovery of fixed and common costs.

A3.62 One possible benefit of recovering all common costs on the retail side of the market is that providers generally have a great deal of flexibility (i.e. to set two- or multi-part tariffs with different fixed and variable elements) and better information on consumer demand than is the case for wholesale services. Price discrimination at the retail level may increase efficiency as increasing the prices paid by some consumers allows MCPs to charge lower prices at the margin, which can increase subscription and ownership.

A3.63 Market evidence does not support some MCPs' submissions that they are currently unduly constrained in their ability to price discriminate across consumers. We are aware that MCPs spend considerable efforts and resources in identifying and marketing their products to different consumer segments.[70] Non-linear prices are widespread with many tariffs - even in the pre-pay segment - including fixed (or quasi-fixed) charges (such as call set-up or connection charges). In addition, fixed charges in pre-pay will comprise handset pricing when provided by the MCP (along with any handset subsidy). We have not argued that MCPs can engage in perfect price discrimination. Neither do we argue that a shift to pure LRIC requires MCPs to become better at price discrimination than they are currently. We observe, however, that currently the degree of price discrimination at the retail level is substantially larger than at the wholesale level. This means that we expect that a switch to pure LRIC would lead to a recovery of common costs from the retail side of the market without significant inefficiencies arising on the retail side of the market (as discussed in Section 7).

A3.64 Some stakeholders argued that if using retail prices to recover fixed and common costs led to substantial benefits to consumers then MCPs would already do this, thereby eliminating the need for MTR regulation. However, this reasoning relies on MCPs' private incentives being fully aligned with socially efficient outcomes. The incentive of MCPs to price optimally (from a societal perspective) is likely to be distorted where the MTR they set affects retail competition (and where F2M and M2M termination rates are set at the same level because of the risk of arbitrage). See the discussion in Section 5 about the expected consumer detriment from a lack of regulation.

A3.65 One concern raised by O2 is that placing a greater burden of common cost recovery onto the retail market would entail greater tariff complexity.[71] Some consumer groups also highlighted the importance of pricing simplicity.[72] We agree that transparency is important, but it does not follow that, to recover fixed and common costs from retail charges, more complex tariffs may result. Rather, that given the currently observed degree of retail price discrimination it could be less

[70] See for example page 3 of O2's presentation on consumer segmentation analysis, which refers to detailed information held on mobile consumers: http://www.demographicsusergroup.co.uk/resources/2009conf-Andrew_Day.pdf.
[71] Paragraph 88 of O2's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/O2.pdf.
[72] For example, see page 6 of Consumer Focus' response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Consumer_Focus.pdf.

distortive to recover the common costs that make up for the difference between pure LRIC and LRIC+ at the retail level – or to a degree from unregulated wholesale charges. We also note that a number of respondents (such as BT and H3G) have highlighted how the adoption of pure LRIC would help move to simpler flat-rate tariff plans (including FCPs offering unlimited call bundles including calls to both fixed and mobile numbers).

A3.66 We do not agree with stakeholders' assertions that they are unduly constrained in their ability to price discriminate in the retail market. While in practice for the majority of markets (including retail mobile markets) price discrimination might not be perfect, the available evidence suggests that MCPs can and do engage in extensive price discrimination – and the diversity of the offers made to consumers in the retail market is self-evident. This suggests that it may be more efficient to recover most common costs from retail than wholesale services.

Externalities

A3.67 We do not consider that externalities (either call or network externalities) need form part of our reasoning with respect to allocative efficiency for the reasons discussed in our April 2010 consultation.[73] In this respect, we have not received any further evidence since the April 2010 consultation suggesting the presence of either uninternalised call or network externalities. Some respondents argued that a surcharge for network externalities would be required to ensure that low income subscribers are retained.[74] In significant part, discussion of this point is related to the distributional impacts on "vulnerable" consumers (see Section 8 and paragraphs A3.291 to A3.320 below). In considering the price control matters in relation to the appeals against our 2007 MCT Statement, the CC concluded that a network externality surcharge on MTRs was not an effective way to achieve efficient levels of mobile subscription and renewals given the high level of "leakage" – i.e. such leakage limited the effectiveness by which the surcharge was used to attract marginal subscribers.[75]

A3.68 We do not agree with O2's submission that, "*the absence of any evidence of uninternalised call externalities significantly undermines the case to introduce a pricing mechanism that does not allow common and fixed cost recovery*".[76] O2 seems to argue that this necessarily rules out pure LRIC pricing as there is no evidence of uninternalised call externalities. We think this argument could be relevant if we wanted to set MTRs below pure LRIC (as in the case of B&K) but not to the choices that, at a minimum, permit recovery of the pure LRIC of MCT.

Impact on mobile usage and ownership

A3.69 We have discussed this extensively in section 7.

[73] Paragraphs A12.67 to A12.75 at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/annexes/wmvct_annexes.pdf.
[74] For example, see paragraph 66 of EE's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Everything_Everywhere.pdf.
[75] See Section 4 of the CC's determination (Competition Commission, *Mobile phone wholesale voice termination charges, Determination (Hutchison 3G UK Limited v Ofcom; British Telecommunications plc v Ofcom)*, 16 January 2009): http://www.competition-commission.org.uk/appeals/communications_act/mobile_phones_determination.pdf
[76] Paragraph 76, page 17 of O2's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/O2.pdf.

Impact on the fixed sector

A3.70 BT and a number of other FCPs submitted that we should take a broader view than simply focusing on the impact on the mobile sector. In other words, we should consider how allocative efficiency may be affected by impacts on fixed services markets (or in some submissions, F2M calls specifically), as well as mobile markets. We agree that we should consider the impact on all consumers of different MTR levels, including outcomes and impacts that are reflected in fixed markets as well as mobile markets. EE argued that FCPs in the last few years have not passed through reductions in MTRs to fixed subscribers in the form of lower F2M retail call charges. Reductions are likely to have taken different forms as explored in detail in paragraphs 7.182 to 7.198 in section 7.

Dynamic efficiency

April 2010 consultation

A3.71 In our April 2010 consultation[77] we discussed whether pure LRIC or LRIC+ would lead to greater dynamic efficiency.

A3.72 In general, we thought that LRIC+ would not raise as many concerns about MCPs raising insufficient revenues to cover the cost of termination. However, we did not consider that this was a strong argument in favour of LRIC+. MCPs do not, generally, invest in call termination separately from, for example, call origination or on-net inbound calls. The important question is whether a particular cost standard affects the MCPs' ability to achieve an overall level of return that provides the correct incentives to invest in their networks to jointly provide both termination and origination.

A3.73 While it is likely that, under pure LRIC, MCPs would be able to recover some of the common costs they recovered from termination from retail services, recovery may be partial due to a likely incomplete 'waterbed' effect. It follows that reducing the flow of funds from fixed to mobile providers is likely to leave MCPs worse off than they would have been, had this transfer been preserved – put another way, MCPs' overall profits could decline. This was not, in our view, an argument for adopting LRIC+: the fact that a transfer of resources from the fixed sector existed in the past, is not in itself a valid reason to maintain it. In terms of dynamic efficiency, our main concern was whether the decline in overall profits could be of such an extent to trigger concerns about the MCPs' ability to finance their investments going forward bearing in mind that future investment will be driven by the expectations regarding future profitability.

A3.74 In terms of dynamic efficiency, our preliminary conclusion in the April 2010 consultation was that we did not believe there was much difference between the two approaches. We noted that although in principle pure LRIC carries a greater risk of setting MTRs too low, this is likely to be countered, primarily, by the waterbed effect (although we accepted that this may be incomplete).

[77] See paragraphs A12.80 to A12.86 at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/annexes/wmvct_annexes.pdf.

Stakeholder responses

A3.75 A number of stakeholder comments on dynamic efficiency were discussed in our April 2010 consultation[78] based on responses to the May 2009 consultation.

A3.76 In response to our April 2010 consultation, a number of stakeholders submitted that a move to pure LRIC would reduce investment by providers of MCT. Others did not agree. Some argued that pure LRIC would be consistent with promoting efficient investment and some argued that enhanced competition would be a spur to innovation and investment.

A3.77 Virgin Media argued that a pure LRIC approach fails to allow MCPs to recover an adequate return and is likely to dissuade them from making necessary investments in the mobile market.[79] Colt noted that failure to recover common costs through MTRs could reduce investment in 3G coverage and High Speed Downlink Packet Access (HSDPA).[80]

A3.78 Consumer Focus highlighted that past MTR reductions have been associated with predictions by MCPs of negative consequences for consumers that were not borne out in reality.[81] It did note, however, that the more challenging economic situation may make the absorption of lower MTRs different this time and that this should be taken into account.

A3.79 EE considered[82] that our proposals would largely eliminate a key revenue source for MCPs which would lead to substantial market disruption with the risk that:

3.79.1 industry returns fall even further below the cost of capital;

3.79.2 investments in new services are delayed or curtailed; and

3.79.3 further consolidation might be necessary to preserve adequate returns.

A3.80 EE argued that pure LRIC does not promote efficient investment. It noted that for both T-Mobile and Orange the return on capital employed had already been below our estimate of the cost of capital for the mobile industry for the last three years and (in its submission) our proposals would further reduce those returns.[83]

A3.81 EE also highlighted that the mobile market was reaching capacity constraints due to the current availability of spectrum and would need to roll-out LTE networks – investment in both of these would be at risk.[84] EE was concerned that we had failed to account for the significant differences between the UK mobile market and the

[78] See paragraphs A12.80 to A12.86 at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/annexes/wmvct_annexes.pdf.
[79] Page 8 of Virgin Media's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Virgin.pdf.
[80] Page 5 of Colt's response. to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Colt.pdf.
[81] Page 4 of Consumer Focus' response, to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Consumer_Focus.pdf.
[82] Paragraphs 19-24 of EE's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Everything_Everywhere.pdf
[83] Paragraph 6 of EE's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Everything_Everywhere.pdf.
[84] Paragraph 6 of EE's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Everything_Everywhere.pdf.

considerable majority of other EU mobile markets.[85] The UK has a fiercely competitive mobile market and already has the lowest margins and return on investment of any EU market. EE argued that UK consumers will ultimately be harmed if the international operator groups limit further investment in the UK and if increases in retail pricing limit the take-up of new services.[86]

A3.82 O2 argued that a move to pure LRIC would negatively impact investment.[87] O2 highlighted that as Ofcom's position appears to be that the waterbed effect is not complete this would mean that MCPs would be unable to recover fully the losses attributable to a move to pure LRIC. It noted that MCPs fund capital expenditure from incomes before depreciation and amortisation. This means that MCPs are targeted and attract investment based on their ability to generate free cash flow (income before depreciation and amortization minus capital expenditure). O2 argued that a reduction in MTRs will put pressure on capital expenditure as MCPs seek to maintain cash flows.

A3.83 O2 noted our arguments that investment will in any case occur to reflect required capacity for voice origination, but it argued that this argument ignores the fact that if the waterbed effect is not complete the pool of funds available for investment will fall.[88] It argued that if MCPs have to recover more fixed and common costs from the retail side, this will depress demand for origination services and hence investment in capacity. Even if lower MTRs did generate additional calls this would only serve to deteriorate network quality where funds are no longer available for additional capital expenditure. The greater recovery of cost from data and possibly lower handset subsidies will also lower take-up of smartphones and other data services, which are an important driver of capacity and investment – the benefits of which would accrue to voice as well.

A3.84 O2 highlighted that we were apparently concerned about the impact that a large and rapid change in MTRs would have on investment if there were a move to 'bill and keep'.[89] O2 considered that this was inconsistent with the position taken on pure LRIC, which in its view was closer to 'bill and keep' than the adoption of LRIC+.

A3.85 O2 also highlighted[90] the impact that a major change in the regulatory regime would bring and the uncertain climate this creates for investors in the mobile industry, which could hit investment.[91] (We understand its point here to be that without regulatory consistency there was likely to be a higher premium applied to the mobile industry to reflect these regulatory risks, ultimately resulting in a higher cost of capital, which would again pose greater challenges to investment).

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[85] Paragraph 31 of EE's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Everything_Everywhere.pdf.
[86] Paragraph 37 of EE's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Everything_Everywhere.pdf.
[87] Paragraph 124 of O2's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/O2.pdf.
[88] Paragraph 125 of O2's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/O2.pdf. .
[89] Paragraphs 127 to 129 of O2's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/O2.pdf.
[90] Paragraph 51of O2's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/O2.pdf.
[91] Paragraphs 130-131of O2's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/O2.pdf.

A3.86 O2 noted that we had previously highlighted the asymmetry in consumer impacts related to MTRs and investment and tended to err on the side of caution in setting MTRs. In its view, this tendency to err on the side of caution pointed to LRIC+ over pure LRIC. [92]

A3.87 H3G noted that some MCPs have argued that cutting MTRs would hinder investment in mobile broadband.[93] However, H3G considered that this concern was misplaced as it assumed that voice MTRs are needed to cross-subsidise this investment. H3G notes that a number of independent sources confirm that mobile broadband pricing is sustainable and highly competitive without a cross-subsidy from other services. The mobile broadband market is already starting to see some changes in pricing in response to market pressures – such as the withdrawal of unlimited mobile broadband tariffs. H3G also noted that investment in mobile broadband is growing fastest in markets with low voice MTRs and by operators not even present in the voice market. Further, there are a number of potential new entrants showing interest in future UK spectrum auctions. New entry solely in mobile broadband would not be feasible if market prices reflected a cross-subsidy. Indeed, H3G thought that the fact that high MTRs could be used to cross-subsidise mobile broadband is a reason why they should be reduced as this would only serve to undermine competition.

A3.88 The Post Office considered[94] that a reduction in termination rates did not pose any serious threat to the major MCPs as they could easily absorb any lost revenues. It also noted, in any case, that capital expenditure in infrastructure is no longer at historical levels when the major mobile operators were building and developing their networks.

A3.89 BT also argued[95] that the predicted detrimental impacts on investment should not be overstated. According to BT, it is important to recognise that it is the net impact on MCPs' revenues (net inflows and net outflows) that should matter. BT argued that because termination payments mostly net out between larger MCPs the level of MTRs should not have any impact on the overall profitability of the industry. It argued that the reductions in MTRs paid for by fixed consumers can be valued at £150m each year – just 1% of MCPs' UK annual revenues. BT also noted that MCPs would argue that lost MTRs would be recouped in any case from higher charges elsewhere via the waterbed effect.

A3.90 BT also argued[96] that mark ups on MTRs created distortions in the amount of investment in the fixed sector as a result of high MTRs and that investment based on subsidies from fixed consumers is not efficient. BT said that high MTRs distort choices between mobile and fixed leading to too high investment in mobile and too little in fixed. BT also noted that the 2009 EC Recommendation argued that greater revenue opportunities will arise as mobile and fixed converge – with more competition and more investment as a result.

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[92] Paragraph 141 of O2's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/O2.pdf.
[93] Paragraphs 102,116 and Annex G of H3G's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/H3G.pdf.
[94] Page 3 of the Post Office's response to our April 2010 consultation at. http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Post_Office_Limited.pdf.
[95] Pages 24 to 25 of BT's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/BT.pdf.
[96] Page 23 of BT's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/BT.pdf

A3.91 BT anticipated[97] that some incumbent MCPs might argue that setting lower MTRs would create disincentives to invest in the UK mobile industry relative to other countries. BT countered this view by observing that pure LRIC was in fact being implemented across the EU – so any relative disadvantage would be small. It also argued that the fixed sector should not be ignored. BT argued that if the UK does not apply pure LRIC, it will be relatively less attractive for fixed network investment than the rest of Europe.

Ofcom's analysis

A3.92 We conclude that in terms of the impact on dynamic efficiency, the potential difference between pure LRIC and LRIC+ is small, but may marginally favour LRIC+.

A3.93 In considering the impact on dynamic efficiency of each cost standard, our starting point is that the level of MTRs has an impact on two sources of revenues for MCPs:

3.93.1 First, lower MTRs reduce the contribution to common costs from fixed callers. Whether this affects overall profitability depends on the strength of the waterbed effect. We conclude that the waterbed effect in this case is likely to exist but that it is likely to be incomplete.[98] Lower MTRs would also lead to an increase in F2M calls and this would increase the value of a mobile subscription to mobile consumers.[99] MCPs would be able to capture this increase in consumer value, at least in part, via higher fixed fees. Hence, for these two reasons (particularly the presence of the waterbed effect) we expect any possible reduction in profits from this effect to be limited – specifically, to be less significant than some submissions argue.

3.93.2 Second, the level of MTRs also affects the revenues MCPs receive from calls from other MCPs and what they pay to other MCPs to terminate their own customers' calls.

3.93.3 If traffic was balanced what a MCP loses in termination revenue from incoming calls, it saves on termination it pays to other MCPs. This is why, overall, the main driver of net profits in termination is the transfer from the fixed sector.[100]

3.93.4 However, as we discuss below (when we consider competition effects), traffic is not perfectly balanced so MCPs with fewer subscribers might suffer larger net outpayments under LRIC+. In this case, therefore, high MTRs have a negative impact on the profitability of MCPs with fewer subscribers and a positive impact on MCPs with more subscribers. In other words, the impact of high MTRs is asymmetric with consequences for competition (as highlighted below) but also, potentially, on investment

[97] Page 24 of BT's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/BT.pdf

[98] As set out in Section 7, it is not necessarily the case that the extent of the waterbed effect we observe today under high MTRs, would necessarily hold going forward. In future, we may observe a more complete waterbed effect as MCPs adjust to changing market circumstances including changes to regulated MTRs.

[99] As noted above we take a conservative approach so that we do not rely on uninternalised call externalities for our conclusions, but in this case we highlight that the likely shortfall in profits for the MCPs would be lower if uninternalised call externalities are present and material.

[100] Note though that even with balanced traffic we would still have strategic effects among MCPs that we discuss in the section on competition below.

incentives – and hence the question of dynamic efficiency. In particular pure LRIC might make MCPs with fewer subscribers more aggressive so that they invest more and the MCPs with more subscribers will also have to invest more to match the investment of the former.

A3.94 In order for MCPs to face a material impact on profitability and incentives to invest and innovate, a number of factors would need to hold:

3.94.1 MCPs do not currently and in the future earn at least their cost of capital;

3.94.2 The waterbed effect is incomplete to a degree to make a material impact;

3.94.3 There is limited scope for MCPs to reduce costs other than cutting investment – i.e. reducing investment would be the most profitable course of action for MCPs.

A3.95 We discuss each of these below. Our position on the profitability impact is also set out more fully in Section 10 in the context of the glide path discussion.

A3.96 A number of stakeholders have highlighted that MCPs have argued each time MTRs have been set under a charge control (for example, in 2007, 2004 and further back) that lower MTRs will reduce investment, whereas the experience has been one of continued entry and innovation in the sector. We have reviewed some of the arguments and submissions made in previous regulatory proceedings.[101] The arguments presented in the past are, at times, very similar to those presented in the context of this review, and the harmful impact on investment of lower MTRs predicted at those times does not seem to have occurred. This is not, by itself, evidence that the current predictions of future harm to investment as a result of further reductions in MTRs are wrong. The counter view expressed by some MCPs is that predictions based on the past may not be relevant if we have now hit a level of industry returns that is not sustainable (a 'tipping point') whereby investment levels must now decline to maintain a reasonable rate of return.[102] Another concern is that in the past arguments about reductions in MTRs were confined to purported errors of underestimating the true costs of termination. In moving to pure LRIC, O2's argument is that there is a greater risk of a real reduction in revenues if the waterbed effect is not complete (see paragraph A3.83 above).

A3.97 In our view, the best interpretation of the available market evidence, including the long sequence of adjustments made in relation to previous reductions in MTRs, is that MCPs will adjust to the new equilibrium where more revenue is recovered from the retail side of the market than previously. MCPs will be unlikely to be able to fully recover the reduced payments from FCPs. As such, MCPs may experience slightly reduced profitability overall unless they can find cost savings (and FCPs might correspondingly slightly increase their profitability with a less than complete pass through).[103] In this respect, capital investment may be one thing that MCPs scale

[101] In the responses to the March 2006 MCT consultation, see for example pages 16-17, 23,59 and Annex C of T-Mobile's submission (http://stakeholders.ofcom.org.uk/binaries/consultations/mct/responses/tmobile.pdf); page 9 of Vodafone's submission (http://stakeholders.ofcom.org.uk/binaries/consultations/mct/responses/vodafone.pdf); and page 18 of O2's submission (http://stakeholders.ofcom.org.uk/binaries/consultations/mct/responses/o2.pdf).
[102] See for example paragraphs 18-24 of EE's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Everything_Everywhere.pdf.
[103] As stated in Section 7, we expect pass-through by FCPs, but if this pass-through is less than complete then we note that there could be a slight increase in FCPs' profitability.

back upon, but we note that there are other ways to reduce costs (e.g. amount of handset subsidies). Historic profitability in the industry will also not necessarily be a good indicator of future profitability as (a) the industry now comprises four national MCPs rather than five after the T-Mobile-Orange merger (and a number of industry analysts expect profitability to increase in a more concentrated market)[104], (b) network sharing deals (e.g., EE/H3G) are reducing investment costs and (c) the uptake of new products is growing rapidly (e.g. smartphones and dongles).

A3.98 EE was concerned that Orange and T-Mobile have earned a return on capital employed (ROCE) below the cost of capital (as measured by the WACC) and that our proposals will have adverse impacts on these returns and push them further below the WACC. In response to this point, and as stated in section 10 and in paragraph A3.97 above, we are cautious about reading too much into historic based profitability analysis and using the ROCE as a measure of profitability.

A3.99 O2 argued that pure LRIC is more akin to B&K, which we had raised concerns about in our May 2009 consultation. However, the issue we raised in the April 2010[105] consultation was that B&K did not allow for any recovery of termination costs at all via MTRs. This meant a risk of 'hot-potato' routing – as originating operators have an incentive to pass on a call to the terminating network at the earliest available opportunity. This in theory may pose a risk of under-investment. However, we noted that termination and origination are jointly produced and, hence, the incentives to invest are only in part driven by the regulated price of wholesale termination. Indeed in our May 2009 consultation we argued that this did not seem to have been a concern for regulators in countries with low (wholesale) termination rates. As such the scope for this concern, particularly as we are considering cost-based termination rates, is unlikely to be substantial.

A3.100 In relation to O2's concerns over the impact of regulatory consistency – we discuss these issues in section 8 under regulatory and commercial consequences in paragraphs 8.126 to 8.157.

A3.101 In summary, we consider that to assess the impact on dynamic efficiency one needs to balance off the reduction in the transfer from the fixed sector which could reduce returns for MCPs (though possibly increase those for FCPs) and the asymmetric impact of high MTRs potentially negatively affecting the profitability of MCPs with fewer subscribers. The reduced profits which MCPs may face from the adoption of pure LRIC (compared to adopting LRIC+) depends largely on the extent of the waterbed effect which allows them to recover (at least in part) from the retail side of the market what is lost from F2M wholesale revenues. It is also interesting to note that H3G currently has the lowest profitability among the national MCPs but is supporting the move to pure LRIC. Given H3G has the lowest profitability among the national MCPs then, if other stakeholders' concerns over dynamic efficiency were correct, we would expect H3G to be concerned about any potential reduction in MTRs and consequential impact on its returns. In fact, it fully supports the adoption of pure LRIC.

A3.102 Therefore, we believe that, if there is an effect of lower MTRs on incentives for the MCPs to invest, it is likely to be small.

[104] See for example: "Orange and T-Mobile merger: positive catalyst", ING, 8 September 2009; and "T-Mobile and Orange in the UK: creating a synergy champion", Enders Analysis, 9 September 2009.
[105] Paragraph A12.83 at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/annexes/wmvct_annexes.pdf.

Competitive effects

Competition among MCPs

April 2010 consultation

A3.103 In our April 2010 consultation[106] we noted H3G's submission (made in response to our May 2009 consultation) that high MTRs (that have emerged historically from the application of LRIC+) could lead to substantial differences in call prices between on- and off-net calls. We noted that, to the extent this was a valid concern, a move to pure LRIC would reduce it. But we noted that there did not appear to be a significant difference in many current mobile retail tariffs.

A3.104 We noted comments by H3G, which in its response to our May 2009 consultation submitted: *"In practice, such price discrimination operates in more subtle ways than simply whether calls to particular numbers are included in-bundle."*[107] We did not see sufficient evidence of substantial call price (or other) differentials between on- and off-net calls at that point to place much weight on the submission. We also considered that the projected future reductions under either LRIC+ or pure LRIC would tend to reduce further the relevance of this issue.

A3.105 In our April 2010 consultation we also explained that lower MTRs would likely lead to lower retail call prices and that this would lead to greater competition among MCPs (and as previously noted, increase allocative efficiency).

Stakeholder responses to the April 2010 consultation

A3.106 BT, C&W, FCS, Federation of Small Businesses (FSB), Gamma, H3G, Plusnet, Post Office Ltd all considered that high MTRs distort competition.[108]

A3.107 Asda submitted[109] that significantly lower MTRs will benefit consumers due to lower costs and greater competition. C&W submitted[110] that it was preferable to have a greater proportion of costs to be recovered through charges constrained by competition rather than regulation. FSB submitted[111] that current MTRs are excessive, distort competition and do not reflect actual costs. BT submitted[112] that high MTRs resulted in a significant transfer of resources from the maverick operator, H3G, to the larger MCPs, which had the effect of damaging competition.

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[106] A12.88 to A12.91 at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/annexes/wmvct_annexes.pdf.

[107] See page 42 of H3G's response to our May 2009 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/mobilecallterm/responses/Hutchison_3G_UK_Limited.pdf.

[108] In some submissions, stakeholders made points about the impact of MTRs in general terms. When stakeholders have referred to 'high MTRs' without elaboration, our understanding is that they generally intend that to mean MTRs above incremental costs, unless the context suggests otherwise.

[109] Asda's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Asda.pdf.

[110] Page 2 of C&W's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Cable_Wireless_Worldwide.pdf.

[111] FSB's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/FSB.pdf.

[112] Page 17 of BT's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/BT.pdf.

A3.108 H3G submitted[113] that MCPs with fewer subscribers face a potential disadvantage due to high MTRs. Part of H3G's explanation relied on a theoretical model building on the academic literature.[114] It argued that MCPs with fewer subscribers face a greater proportion of off-net calls relative to on-net calls. H3G argued that with high MTRs all MCPs have to pay more for outbound off-net calls than on-net calls. As a result, a MCP with fewer subscribers is not able to offer competitive retail tariffs as aggressively as it could with lower MTRs. H3G noted[115] that MCPs with fewer subscribers may benefit from a larger proportion of inbound calls coming from off-net consumers. However, it argued that this in practice would not be sufficient to outweigh the negative effect on outbound calls.

A3.109 H3G contrasted[116] this with the outcome under pure LRIC, where this concern (in its submission) does not arise, assuming that the cost of terminating on- and off-net calls is the same. MCPs with fewer subscribers would still face other disadvantages in attracting consumers – such as competing on coverage quality - but competition would not be distorted by higher MTRs. H3G, therefore, considered that the economic literature clearly explained the disadvantages MCPs with fewer subscribers face when there are mark-ups over marginal costs.

A3.110 H3G also disagreed[117] with our view in the April 2010 consultation that differences between on- and off-net call prices are not very large in the UK retail market. It presented evidence that it claimed showed large existing differences between on- and off-net call prices. It submitted that the majority of pre-pay tariffs had higher per-minute prices for off-net calls compared to on-net. In post-pay, on- and off-net differentiation often takes the form of large inclusive bundles for on-net calls. It noted that these bundles – that exclude off-net calls or include fewer inclusive off-net minutes - have the effect of making the contracts offered by MCPs with fewer subscribers less attractive from a consumer's point of view, even at identical per-minute prices for the calls included in the bundle.

A3.111 BT made a similar submission.[118] It referred, in particular to higher end contracts – such as large business users where unlimited bundles of on-net calls were common.

A3.112 H3G did not consider[119] that the existence of large differences in on- and off-net call prices was crucial to its argument that MCPs with fewer subscribers faced a competitive disadvantage from higher MTRs. It still considered any differences in on- and off-net call prices would have a material impact. But it argued that the

[113] Paragraph 8 of H3G's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/H3G.pdf.
[114] In Annex B of its submission (http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/H3G.pdf), H3G explicitly derived results that rely on a paper by Lopez and Rey (Lopez, Angel and Patrick Rey (2009) "Foreclosing Competition through Access Charges and Price Discrimination," IDEI Working Papers 570, Institut d'Economie Industrielle (IDEI), Toulouse).
[115] Paragraph 338 of H3G's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/H3G.pdf.
[116] Paragraph 339 of H3G's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/H3G.pdf.
[117] Paragraph 353 of H3G's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/H3G.pdf.
[118] Page 13 of BT's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/BT.pdf.
[119] Paragraph 354 of H3G's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/H3G.pdf.

smaller share of subscribers of a MCP, such as H3G, created a competitive disadvantage under high (symmetric) MTRs due to its lower proportion of on-net calls. Even where traffic is balanced, H3G argued that high symmetric MTRs would still provide them with an incentive to compete less aggressively on price. MTRs, it argued, effectively place a floor on retail prices.

A3.113 H3G accepted[120] that factors other than (relative) subscribers' share affect competition in retail mobile markets, but considered that high MTRs were the most important barrier because price competition can have an immediate impact on the balance of inbound and outbound calls. In particular, MCPs could reduce prices to attract consumers or increase call volumes, however, that would result in an increase in the proportion of outbound traffic compared to inbound – we termed this the "outbound/inbound calling ratio" in our November 2010 consultation (H3G termed this the "reciprocation rate"). This arises because MCPs' prices for calls drive the volume of outbound calls while inbound call volumes depend on the prices set by rival MCPs.[121]

A3.114 Therefore, any attempt to compete on price by MCPs with fewer subscribers is costly. Indeed, H3G argues[122] that this has been its experience. It stated that it has always priced below its rivals to attract consumers (due to its lower proportion of on-net calls), but its attempts to gain subscribers have often resulted in unsustainable costs from an increase in outbound traffic and, hence, overall termination payments. While its incoming M2M revenues have grown steadily, the resulting increase in off-net M2M traffic payments has always more than offset this benefit. This traffic imbalance and high net outpayments to other MCPs at high MTRs, it argued, creates a barrier to competition.

A3.115 H3G also argued[123] that high MTRs have made it difficult to enter and expand in certain consumer segments. Because of H3G's limited on-net traffic, attracting consumers that make a large number of outbound calls (which it termed high-end) would only result in higher outpayments. H3G's subscriber share in early 2010 was only significant in the mid-market tariff segment and it claimed it has not been able to compete for the high-end of the market because of this barrier.

A3.116 H3G claimed[124] that historic evidence shows that lower MTRs have resulted in lower retail prices. H3G highlighted that this point has been recognised in various statements that other MCPs and/or their parent companies have made to investors concerning the impact on the retail pricing of regulation pushing down MTRs across Europe. H3G also cited a number of investment analysts' views on the impact that lower MTRs have on the degree of competitive pressure entrant MCPs can exercise in the retail market (these are discussed below).

[120] Paragraph 56 of H3G's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/H3G.pdf.
[121] Footnote 13 of H3G's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/H3G.pdf.
[122] Paragraph 50 of H3G's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/H3G.pdf.
[123] Paragraph 64 of H3G's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/H3G.pdf.
[124] Paragraphs 72-77 of H3G's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/H3G.pdf.

A3.117 H3G also argued[125] that its success in mobile broadband markets shows that it has been able to compete effectively and expand in a market segment where there are no MTRs. Lastly, H3G argued that the UK market is now even more asymmetric in terms of MCPs' shares of subscribers following the merger of Orange and T-Mobile (and also relative to countries in the European Union where other NRAs have imposed pure LRIC). Greater asymmetry, H3G argued, makes the case for pure LRIC in the UK stronger. [126]

A3.118 By contrast, some stakeholders considered that the evidence presented by Ofcom did not suggest any harm to competition. Virgin Media, for example, suggested that Ofcom's final conclusions in support of competitive impacts were weak and unsupportive of a move towards pure LRIC. [127]

A3.119 EE noted[128] that we had dismissed H3G's arguments over different on- and off-net retail call prices in our April 2010 consultation. It argued that the trend has been for discounted on-net pricing to become less common over time as consumers prefer flatter tariff structures. Nor, it submitted, was there any evidence that any differences in prices that had previously existed had harmed competition. EE argued that MCPs with fewer subscribers were, in any case, the first to offer discounted on-net prices in periods when markets were becoming more competitive.

A3.120 O2 agreed[129] with our views in the April 2010 consultation on the absence of evidence of substantial differences in on- and off-net call prices (however it also argued that these differentials were shrinking which implies that it believed they still exist).[130] O2 submitted that while MCPs with fewer subscribers may have proportionally more of their outgoing calls terminating off-net, the overall impact of high MTRs depends on the MCP's balance of traffic – i.e. its outbound/inbound calling ratio rather than its share of subscribers.

A3.121 O2 argued[131] that MCPs with fewer subscribers are able to target different consumer types – for example some target consumers with high outbound/inbound calling ratios and some target consumers that have low calling ratios (i.e. they are net receivers of M2M traffic). The fact that a particular MCP with fewer subscribers (such as H3G) has not been successful in its strategy does not call for changing the termination regime. O2 argued that on- and off-net price discrimination is essentially a matter of economies of scale and network effects that are normal in competitive markets and that entrants must overcome over time. Indeed, it argued that Orange and T-Mobile as later entrants were not constrained in their ability to compete.

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[125] Paragraphs 102-117 of H3G's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/H3G.pdf.
[126] Paragraph 188 of H3G's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/H3G.pdf.
[127] Page 7 of Virgin Media's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Virgin.pdf.
[128] Paragraph 122 of EE's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Everything_Everywhere.pdf.
[129] Paragraphs 133-137 of O2's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/O2.pdf.
[130] Paragraph 139, page 33 of O2's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/O2.pdf.
[131] Paragraph 134 of O2's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/O2.pdf.

A3.122 O2 also referred[132] to what it submitted was inconsistency in our reasoning. It pointed to our consideration of H3G's arguments in the appeals against our 2007 MCT Statement, where we had argued against giving entry assistance to entrants via MTRs. O2 argued that the discrepancy in our approach to this issue and the evidence of converging on- and off-net prices suggested that a reduction in MTRs associated with pure LRIC is not warranted.

Ofcom's analysis (including an assessment of the arguments and the responses to the November 2010 consultation where relevant)

A3.123 In the following paragraphs we set out our analysis including an assessment of the arguments of stakeholders in response to our April 2010 consultation. Our consideration and analysis of these responses prompted us to issue a separate consultation in November 2010 on a discrete competition issue. Our November 2010 consultation and the responses to this are particularly relevant to the competition impacts on different consumer segments, which we discuss in more detail below.

A3.124 For a variety of reasons, MCPs with fewer subscribers may be at a disadvantage in the first few years after entry; this is unlikely to be due exclusively to high MTRs. Therefore, we need to consider to what extent high MTRs *all else equal* could act as a barrier to entry or expansion for MCPs with fewer subscribers.

A3.125 Our assessment does not focus on H3G as a MCP with fewer subscribers and whether it would be better off as a result of a move to pure LRIC. Instead we focus on whether choosing LRIC+ instead of pure LRIC would affect the ability of one or more MCPs to enter and expand in the UK retail market. Could LRIC+ lead to reduced competition in the provision of retail mobile services, compared with a scenario in which we adopt pure LRIC?

A3.126 This issue was considered in the Explanatory Note to the 2009 EC Recommendation:

> *"Above-cost termination rates can give rise to competitive distortions between operators with asymmetric market shares and traffic flows. Termination rates that are set above an efficient level of cost result in higher off-net wholesale and retail prices. As smaller networks typically have a large proportion of off-net calls, this leads to significant payments to their larger competitors and hampers their ability to compete with on-net/off-net retail offers of larger incumbents. This can reinforce the network effects of larger networks and increase barriers to smaller operators entering and expanding within markets."*[133]

A3.127 We have therefore considered whether:

- there are, in fact, differences in the price of on- and off-net calls in the retail packages currently offered in the UK market ("retail effects");

[132] Paragraphs 138 to 139 of O2's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/O2.pdf.

[133] See page 16 of the explanatory note of 7 May 2009 accompanying the EC Recommendation on the Regulatory Treatment of Fixed and Mobile Termination Rates in the EU: http://ec.europa.eu/information_society/policy/ecomm/doc/implementation_enforcement/eu_consultation_procedures/explanatory_note.pdf

- high MTRs impair the ability of MCPs with fewer subscribers (and a higher proportion of calls off-net) to compete due to the higher average termination costs per outbound call (and whether this limits the ability and incentives of *all* MCPs to compete aggressively on price ("market wide effects"));

- high MTRs reduce the incentive of MCPs with fewer subscribers to compete for certain consumer segments.[134] ("impact on competition for different consumer segments"); and

- taking these effects together, we should be concerned about the impact of symmetric MTRs at LRIC + rather than pure LRIC on competition among MCPs.

Evidence of on- and off-net retail prices (and any effect on retail competition)

A3.128 Having assessed the evidence presented, in particular, by H3G (in response to our April 2010 consultation and our November 2010 consultation) and BT, and collected by us, it would appear that differences between on- and off-net retail call prices are greater than we had acknowledged in the April 2010 consultation. As suggested by BT and H3G, there are a number of tariff packages that either explicitly or implicitly offer lower on-net call prices (such as cheaper prices for selected friends and family numbers on the same network).

A3.129 We have looked at available evidence from Pure Pricing's UK Mobile Pricing Factbook (Q3 2010).[135]

A3.130 For contract (or post-pay) plans there are a number of packages offering 'flat rates' (e.g. H3G, O2, Orange and T-Mobile). Hence, the same rate is charged for a call to any network. However, there are also examples of price differences between on- and off-net calls, including, for example:

3.130.1 Plans for which out-of-bundle call prices differ and the price of an off-net call is typically significantly higher than for on-net (see Table A3.1 below);

3.130.2 A number of contract plans to non-business consumers often offer more on-net minutes than off-net (although this is not universal);

3.130.3 Contract plans often include "bolt-ons" offering free calls to elected on-net friends and family numbers;

3.130.4 Contract plans for business consumers often offer unlimited on-net minutes;

3.130.5 Business consumers also often face higher call prices for out of bundle off-net calls compared to on-net; and

3.130.6 Where there is no differentiation between the on and off-net call prices in a particular contract plan, the (single) call price in this package is always

[134] We also consider whether under high MTRs, MCPs with a large share of subscribers have less of an incentive to compete for consumers with a low outbound/inbound calling ratio.

[135] There is less information available on pricing for larger corporate consumers as MCPs are more likely to make bespoke offers, together with other services.

higher than the on-net call price in other packages where there is a difference in on- and off-net call prices.[136]

Table A3.1: Examples of mobile tariff with on-net / off-net call price differentials

MCP	Tariff plan	Key rates (out of bundle minutes)	
		Own network (ppm)	Other mobile (ppm)
H3G	One-plan/Internet texter	10	25
	Internet talker	12	
	Business share	Free	16
	Business flat rate	6	20
	Business 600/900	8.5	21.3
	Business Mix and Match	10.21	
O2	All contracts (except unlimited)	20	
	Free on-net (£25 per month spend) + online	Free	20
	Business	Free	30
	Business (unlimited)	Free	
Orange	All consumer contracts	20 (or free for elected on-net "magic numbers")	20
	Business	10	30
T-Mobile	All consumer contracts	30	30
	Business	8.51	29.79
	Business (unlimited)	Free	
Vodafone	Consumer contracts	20	35
	Business choice	10	30
	Business essentials	12.7	29.7
	Business clarity	Free	

Source: Pure Pricing's UK Mobile Pricing Factbook (Q3 2010).

A3.131 For pre-pay plans:

3.131.1 There are a number of pre-pay plans offering lower call prices for on-net calls longer than a certain duration (e.g. 25ppm for first 3 minutes, 5ppm thereafter for on-net calls only).

3.131.2 Pre-pay plans also offer "bolt-ons" with higher bundles of minutes for on-net calls relative to off-net, and

3.131.3 Pre-pay often also have top-up rewards that allow free-calls to all or selected on-net consumers subject to minimum monthly top-ups.

A3.132 For SIM-only plans:

3.132.1 A number of SIM-only packages offer residential consumers significantly more on-net than off-net minutes[137] (although this is not universal); and

[136] For example, the H3G one-plan/Internet texter packages have out of bundle on-net call charges of 10ppm and off-net of 25ppm, whereas its Internet talker plan has a single rate for out of bundle minutes of 12ppm.

[137] For H3G's £10 and £15 per month SIM-only plans it offers (respectively) 100 and 300 minutes to any network compared to 2000 on-net minutes. O2 offers plans online with the benefit of free on-net

3.132.2 Some MCPs offer business SIM-only plans with unlimited on-net calls.

A3.133 On the other hand, it remains true (as we noted in our April 2010 consultation) that many available contract plans provide consumers with a large number of inclusive any network minutes. To the extent that these consumers do not fully utilise their monthly allocation of minutes then they may not have to pay different prices for on – and off-net calls. Nevertheless, as stated above there are a number of tariff plans where calls to on-net are discounted relative to off-net.

A3.134 The presence of these significant differences in on- and off-net call prices may place MCPs with fewer subscribers at a disadvantage. This is due to the potential 'club effect' as was explained in a recent Analysys Mason note:

> *"When market shares are highly unbalanced, a subscriber selecting an operator will not only take into consideration the different tariff plans available on the market and what they will pay, but may also take into account the fact that people calling them could pay less. If the leading operator applies high on-net discounts, then a 'club effect' (or bandwagon) can develop: the new subscriber only has to select the leading operator in order to call and be called at cheaper rates. Such an effect can be a strong constraint on the development of competition."*[138]

A3.135 In our April 2010 consultation, we had concluded provisionally that differences in on- and off-net retail call prices (or discounted calls to elected on-net numbers) had almost disappeared. Consequently we did not consider that this could put MCPs with fewer subscribers at a disadvantage in attracting subscribers. However, having reconsidered in detail the evidence on this in the light of the submissions we have received, we believe that the presence of these retail tariffs could still provide a competitive advantage to MCPs with a larger share of subscribers. We also note that some MCPs implicitly (EE and O2, while H3G does so explicitly) agree that there is still a differential between on- and off-net call prices.

A3.136 In its November 2010 consultation response, EE argued[139] that even if on-and off-net discrimination were a concern there are less costly ways (such as reliance on *ex post* competition law) to resolve the problem than by setting termination rates below (what it termed) "efficient" levels, particularly as on-and-off net prices are set in retail markets where no operator has been found to be dominant. It submitted that, in any case, further falls in MTRs implied by pure LRIC would not be the right approach to address these concerns – as, for example, on-net pricing is a feature of the US market even with zero or lower termination charges.

A3.137 But we expect that a move to lower MTRs under either cost standard would reduce some of the observed retail differences and most likely pure LRIC could almost, if not fully, eliminate them. For example, as noted by some stakeholders, high MTRs create a barrier to MCPs including large bundles of 'all network' minutes – due to the risk that a high proportion of calls will be off-net (which at higher MTRs would face a higher cost per call than an on-net call). As such, the relevance of the 'club

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calls or calls to fixed lines (excluding "O2 100"). T-Mobile's SIM-only packages also give consumers the option (among other things) of unlimited texts, data, fixed or on-net calls.

[138] http://www.analysysmason.com/About-Us/News/Newsletter/Regulating-on-net-discounts-in-emerging-countries-to-limit-the-club-effect/

[139] Pages 5 to 6 of EE's response to our November 2010 consultation http://stakeholders.ofcom.org.uk/binaries/consultations/mct-large-small/responses/everything-everywhere.pdf.

effect' might reduce in the future under both cost standards, but particularly so under pure LRIC. It may be that MCPs facing the same or similar end-to-end costs for on-and off-net calls may still have incentives to price on-and-off net calls differently (see footnote 147 below).

A3.138 Even if this competitive effect that supports adopting pure LRIC (rather than LRIC+) was not material in isolation, we need to consider this in conjunction with the other factors examined below.

Market-wide effects

A3.139 A further submission made by H3G in response to our May 2009 consultation was that differences in the outbound/inbound calling ratio of consumers combines with the current high level of MTRs to place MCPs with fewer subscribers at a competitive disadvantage. MCPs that expect a large proportion of their traffic to be off-net have a higher average cost of terminating their calls.[140] The regulated MTR effectively sets a floor for the retail price of a call.

A3.140 H3G made further submissions regarding these competition concerns in its response to our November 2010 consultation.[141] It noted that irrespective of their share of subscribers, MCPs respond to differences in the incremental or marginal cost of providing on- and off-net calls (the former being determined by a MCP's own incremental or marginal cost and the latter being determined by MTRs set by rival MCPs). H3G argued, supported by an illustrative model, that if a MCP reduced its price, this would create an outbound traffic imbalance because outbound traffic would grow (it becomes cheaper for this MCP's customers to make calls), while inbound traffic is unaffected. Even if there were two MCPs with equal market share H3G calculated that a price floor would exist for either MCP for outbound calls. It would not be rational to price below this level as this would only create a net outflow of traffic and the MCP would make losses on these additional calls.[142]

A3.141 H3G submitted[143] that, in addition to this effect, MTRs above pure LRIC particularly distort competition between MCPs with different shares of subscribers, reflecting the fact that MCPs with fewer subscribers generate a greater proportion of off-net calls.

A3.142 H3G further submitted[144] that with on- and off-net retail price discrimination (which it argued is still widely prevalent in the UK mobile market), the competitive distortion between MCPs with different shares of subscribers is even greater. This is because MCPs with fewer subscribers need to set their prices much lower than MCPs with a larger share of subscribers just to remain competitive. This is because in order to ensure that the average price of outbound calls is the same as the average price for a MCP with many subscribers, the MCP with fewer subscribers will need to set lower call prices, to reflect its larger proportion of off-net calls. With competitive

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[140] As we discuss below these MCPs also receive more off-net calls and this also needs to be considered in the analysis.

[141] Paragraphs 16-23 of H3G's response to our November 2010 competition consultation http://stakeholders.ofcom.org.uk/binaries/consultations/mct-large-small/responses/h3g.pdf.

[142] H3G argued that lower call prices will tend to attract consumers that make more calls than they receive. ✂

[143] Paragraphs 24-29 of H3G's response to our November 2010 competition consultation http://stakeholders.ofcom.org.uk/binaries/consultations/mct-large-small/responses/h3g.pdf.

[144] Paragraphs 30-31 of H3G's response to our November 2010 competition consultation http://stakeholders.ofcom.org.uk/binaries/consultations/mct-large-small/responses/h3g.pdf.

pressures to lower prices and constraints arising from the retail price floor effects this harms the ability of a MCP with fewer subscribers to compete effectively.

A3.143 H3G's argument is that "retail effects" from different prices for on- and off-net calls may well reinforce the "market wide effects" described above. This is because the proportion of calls that are on-net for each MCPs are likely to depend not only on the MCP's mix of consumers but also on the presence in retail markets of some tariffs offering cheaper on-net call prices (which tend to generate the club effects discussed above). A MCP with fewer subscribers has to offer more aggressive average call prices to overcome the on-net pricing of larger MCPs – but it may be constrained in doing so by the price floor created by the high cost of outbound calls (due to high MTRs). Therefore, in assessing the different identified effects, including "retail effects" and "market wide effects" we need to consider that there are interactions between each effect.

A3.144 The "market wide effects" argument put forward by H3G rests on whether under LRIC+ the MTRs that MCPs pay for calls that terminate off-net is higher than the cost MCPs incur for on-net calls. While it is difficult to estimate whether the cost MCPs incur for on-net calls differ from that estimated under LRIC+, we consider that the available pricing evidence[145] and cost evidence[146] suggests that under LRIC+ based MTRs the cost for terminating an off-net call is higher than that for an on-net call. For example, the presence of a difference between on- and off-net call prices may signal that the underlying or perceived cost may be different. Under LRIC+ the cost of terminating calls off-net includes a contribution to common costs. The cost for on-net calls is likely to be lower as we observe lower retail prices for on-net calls.[147]

A3.145 Mobile number portability (MNP) could make it more difficult for a MCP to differentiate between on- and off-net retail prices and lessen the incentive to apply such differences. This is because on-net calls to ported-in numbers pay the MTR of the donor network.[148] However, the proportion of ported calls out of all mobile numbers is relatively small (though not insignificant)[149] and MCPs have taken steps

[145] See Table A3.1 above.
[146] This is discussed in detail in the modelling annexes (Annex 6 to Annex 10).
[147] A caveat to this assumption is that, at least in theory, to the extent that there were uninternalised call externalities then this might provide a motivation for the price of on-net calls to be lower than the price of an off-net calls (even if the end to end costs of each call type were the same). For further discussion of this, see paragraphs A12.70 to A12.75 of our April 2010 consultation. As discussed in our April 2010 consultation, call externalities can be internalised through:

- consumers coordinating their calling behaviour either through calling-circles and/or consumers calling each other back; and/or
- MCPs pricing calls for on-net lower than for off-net calls (see paragraph A12.72.1 of the April 2010 consultation).

As set out in our April 2010 consultation, there is little robust empirical evidence in support of significant uninternalised call externalities. So, it could be that a lack of evidence on uninternalised call externalities might suggest that part of the MCPs' rationale to price on-net calls lower than off-net calls is associated with internalising call externalities. On this basis, we cannot necessarily use retail price differences to make strong inferences over on-net and off-net costs (in additional, strategic pricing behaviour rather than differences in on- and off-net costs may be another motivation for lower retail pricing, as discussed in A3.134).
[148] For more background on the routing of ported calls see: http://rhprod-webstg01:8080/consult/condocs/gc18_routing/routing.pdf
[149] We estimated in our Mobile Number Portability Review that by 2009 up to 15% of all mobile numbers had been ported (see paragraph A5.42-5.43 at http://stakeholders.ofcom.org.uk/binaries/consultations/gc18_routing/summary/routing.pdf).

to avoid paying MTRs to other MCPs for ported-in numbers.[150] The fact that many MCPs have taken steps to ensure that on-net calls to ported-in numbers only face the costs of their own network also suggests that there is a relative cost advantage of doing so.[151]

A3.146 This seems to confirm our hypothesis that the incremental cost for on-net calls is currently lower than regulated MTRs. No submission received in response to our May 2009, April 2010 or November 2010 consultations has presented evidence to the contrary. The cost difference between on- and off-net calls is likely to remain if MTRs continue to be set under LRIC+. Therefore, if we adopted LRIC+ for off-net calls, it seems likely that on-net retail prices will be set using a notional cost below that of LRIC+.

A3.147 Figure A3.1 below shows the proportion of off-net outbound calls for the different operators between 2005 and 2009.

Figure A3.1: The proportion of off-net minutes for each MCP for M2M outbound calls

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Source: Ofcom 2011, analysis based on MCP data gathered using our statutory section 135 information gathering powers.[152] *EE estimates based on aggregation of T-Mobile and Orange's submissions. The proportion of off-net traffic for EE following the merger of Orange and T-Mobile was assumed to become on-net traffic for EE proportional to their subscriber bases.[153]

A3.148 ✂

Figure A3.2: Share of subscribers and the proportion of total M2M outbound minutes that are off-net (Financial Year 2009/10154)

✂

A3.149 Figure A3.2 suggests that there is an inverse correlation between the MCP's share of subscribers and the proportion of calls that are off-net. For example, H3G has the lowest share of subscribers and has a higher proportion of calls that are off-net compared to MCPs with higher shares. However, there is not an exact one-to-one inverse correlation (as indicated by the dotted blue line – e.g. with 40% of subscribers, 60% of calls would be expected to go off-net). There are factors other than the share of subscribers that affect the proportion of M2M calls that are off-net. For example, all MCPs seek to keep traffic on-net when they can. The data reflects these efforts; for all MCPs the proportion of M2M calls that are off-net is smaller than implied by their share of subscribers.[155]

A3.150 Other factors affecting traffic balances include the marketing strategies chosen by individual MCPs, tariffs tailored at calling circles (discussed further in paragraphs A3.197 to A3.209] below) or other actions to mitigate the effects of MTRs above

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[150] We note that at least three of the MCPs have so-called "call-trapping" arrangements. Call-trapping identifies on-net originated calls to ported-in numbers and prevents those calls being routed via the donor network.

[151] Call trapping is not costless but is likely to be relatively low cost as it only requires adjustments to the operators' HLR.

[152] See Annex 4, paragraphs A4.1 to A4.2.

[153] ✂.We performed a similar calculation for calls originated by T-Mobile's subscribers to estimate the proportion of calls that would now be assumed to be on-net.

[154] Based on quarterly data on total outbound calls to mobiles (on – and off-net) obtained from MCPs using our statutory section 135 powers (Q3 2009 to Q2 2010).

[155] ✂

pure LRIC. For MCPs with fewer subscribers, the need for (and value of) these steps is accentuated. The steps that H3G or others may have taken to reduce the proportion of off-net calls are unlikely to be costless. In addition, as discussed in paragraph A3.142 to A3.143,on-and off-net retail price discrimination may reinforce the disadvantage faced by MCPs with fewer subscribers.

A3.151 Taking as given the proportion of M2M calls that are off-net for each of the main MCPs, we have sought to assess the impact of the current level of MTRs on the average cost for outbound calls and the average payment for inbound calls. Figure A3.3 illustrates this for each MCP. This analysis refines the analysis that H3G presented in its response to our April 2010 consultation. In Figure A3.3, we compare by MCP the likely cost differences of an outbound call in 2010/11 (in 2008/09 prices) and net revenues from off-net inbound calls based on the following assumptions:

- the underlying cost for an end-to-end on-net call (i.e. for the on-net origination and termination) is equivalent to twice the incremental termination cost (our estimate of pure LRIC of 0.69ppm);
- for off-net calls the cost of an outbound call includes on-net origination as well as the relevant MTR paid to the terminating MCP (we have used the current lowest regulated MTR of 4.18ppm);
- to determine the proportion of outbound minutes that are on – and off-net we used the most recently available volume data provided by the MCPs[156] (2009/10) (consistent with the data shown in Figure A3.2 above);
- we used the same dataset for inbound termination volumes. However, these data include all inbound volumes as data limitations prevent us from excluding F2M calls;[157] and
- for inbound calls, the average expected net termination revenue (i.e. the MTR net of any incremental termination costs) is based on the proportion of inbound calls that are originated off-net and are thus charged at the MTR.[158]

Figure A3.3: Illustrative impact of MTRs of 4.18 ppm on the cost of outbound calls (M2M) and on inbound termination revenues (all calls including F2M) [CONFIDENTIAL CHART][159]

✂

Source: Ofcom 2011. *EE estimates based on aggregation of T-Mobile and Orange's submissions. The proportion of off-net traffic for EE following the merger of Orange and T-Mobile was assumed to become on-net traffic for EE proportional to their subscriber bases.

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[156] We obtained this data using our statutory section 135 information gathering powers. See Annex 4, paragraphs A4.1 to A4.2.

[157] MCP data on inbound termination volumes did not separately identify calls from mobiles and fixed.

[158] For inbound on-net calls, we assume that there is no wholesale revenue.

[159] Inbound (net) termination rates have been computed as follows. First, we are using net termination revenues (i.e. MTR less cost of termination). Second, for inbound calls it is also weighted in proportion to the number of on-net and off-net inbound calls. This means that a smaller MCP can expect to receive more inbound calls (off-net) and will be able to charge the MTR. We assume for on-net inbound calls that there is zero wholesale revenues. Hence, H3G for instance with ✂ of inbound calls off-net receive a margin of 3.49ppm (4.18ppm – 0.69ppm) and zero wholesale revenues on the remaining ✂ of on-net calls. This means its (average) net inbound termination revenue is ✂.

A3.152 Figure A3.3 suggests that given the current traffic balances the average network cost of an outbound call for H3G is materially higher than the cost for its rival national MCPs with a larger share of subscribers (✂). Notwithstanding these differences, as mentioned above, the effect of the current MTRs is to set an overall retail price floor for every MCP. For example, if the above calculations were indicative of end-to-end call network costs (i.e. assuming zero or minimal retailing costs per call), the largest MCP before Orange and T-Mobile merged, ✂, would not want to set outbound call prices (on average across all its packages) below ✂, while the corresponding price floor under pure LRIC would have been around 1.4ppm.[160]

A3.153 Figure A3.4 updates the above analysis, but assumes instead that the appropriate comparison is forward-looking (albeit with the same volume data[161] as used in ✂ and uses our final estimates of LRIC+ and pure LRIC as at 2014/15 as proxies for off-net and on-net costs).

Figure A3.4: Illustrative impact of MTRs set at LRIC+ (1.61 ppm) on the cost of outbound calls (M2M) and on inbound termination revenues (all calls including F2M)

✂

A3.154 As expected, the differences across MCPs in the weighted average cost of outbound calls are less significant in absolute terms than those shown in ✂. However, Figure A3.4 suggests that ✂. This indicates that MTRs set at LRIC+ may still represent a barrier to entry and expansion even when we use the LRIC+ estimate for 2014/15, though the materiality will be reduced. This high outbound cost for calls would be particularly significant for any MCPs with fewer subscribers such as H3G, Mundio Mobile, C&W and other recent entrants.

A3.155 One of the benefits of pure LRIC is that it would lower the 'price floor' for outbound calls, making it easier for MCPs with fewer subscribers to offer 'all network' bundles of minutes at lower charges. H3G submits that some of its recently launched price plans are based on the assumption that pure LRIC will be implemented for the next charge control period. It cites this as an example of the type of plans that it could introduce if lower symmetric MTRs such as those that would emerge under pure LRIC were introduced. In particular, H3G claims that its "One Plan" (which it claims has been launched in July 2010 in anticipation of pure LRIC being implemented)[162] provides an example of 'all you can eat' bundles that could emerge under pure LRIC. In its submission, H3G claimed that this tariff would provide "all the calls, texts and data that most consumers are ever likely to need"[163] at roughly half the price of comparable offers from other MCPs. H3G submits that such price plans would add significant competitive pressures at the retail level.

A3.156 The weighted average cost of terminating calls sets a price floor for the average retail call prices. This provides a disincentive for MCPs to lower their call prices. If

[160] We have assumed that incremental origination and termination costs are identical (i.e. based on pure LRIC). We have not sought to include any other network costs in this calculation such as transit costs across another operator's network when off-net calls go via a transit operator.
[161] We have used traffic data for 2008/09. However, we note that it is possible that if MTRs were reduced to the level of LRIC+ as currently estimated in this statement the relative traffic figures could change. This is likely to be the case if lower MTRs led to lower off-net charges hence increasing off net traffic for all MCPs. This though is very difficult to estimate with any precision.
[162] ✂
[163] See paragraph 11, page 2 of H3G's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/H3G.pdf.

MTRs decreased, the cost of terminating calls decreases for each MCP (the price floor) and retail price competition would increase as MCPs would have an incentive to reduce their call prices. This means that *all else being equal* lower MTRs increase the incentives of MCPs to compete on price. Based on the effect of MTRs on the outbound calls, this suggests that pure LRIC should be preferred to LRIC+ in this regard.

A3.157 The analysis above has only looked at the weighted average cost of outbound calls. This, however, does not provide the complete picture of the potential competition impact of high (symmetric) MTRs. In particular, in the same manner that MCPs with fewer subscribers might be expected to have a larger proportion of off-net outbound calls, they would also be expected to have a larger proportion of inbound calls that are off-net. Therefore, MCPs with fewer subscribers are expected to receive the regulated MTR for a higher proportion of inbound calls and (other things equal) will be at a relative advantage to larger MCPs. This should offset the disadvantage they experience for outbound calls.

A3.158 For H3G, as suggested by Figure A3.4, the relative advantage that it receives for inbound calls does not fully counter its relative disadvantage for outbound calls.[164] Nevertheless, as a general proposition, it is possible that, for their overall consumer base, MCPs with fewer subscribers could achieve a broadly balanced position (such that higher outbound call costs are off-set by higher inbound receipts). Therefore, for their entire consumer base MCPs with fewer subscribers may not necessarily face a net disadvantage because of their lower proportion of subscribers. Both Vodafone[165] and O2[166] (in its response to our April 2010 consultation) submitted that for MCPs with fewer subscribers the advantage from termination revenues should overcome the disadvantage on outbound calls. O2 also argued that any disadvantage faced by MCPs such as H3G may simply reflect their commercial strategy (i.e. the MCP's disadvantage arises from the decision to target consumers that make more calls than they receive).

A3.159 Responding to our November 2010 consultation, H3G did not agree with the view that the two effects 'net out' overall. It referred to the statement in our November 2010 consultation that "*If traffic flows are balanced, these additional out-payments* [from MCPs with fewer subscribers to those with more subscribers] *would be off-set against the equally high proportion of calls to the smaller MCPs' subscribers that originate on another network.*"[167] H3G submitted that even if a MCP with fewer subscribers attained a position where it had balanced traffic flows – we refer to this below as having an outbound/inbound calling ratio at or close to one - this would not remove its competition concerns with respect to price floors. H3G argued that MCPs can only set the price for outbound calls not inbound calls (it noted that the latter is based on the retail prices set by rival MCPs). H3G submitted that only the marginal cost of outbound calls is relevant for a MCPs' own retail pricing and competitive decisions (as it would have no influence over the regulated MTR). Any attempt to lower call prices to attract consumers would simply generate a greater (net) outflow of calls undermining the balanced calling position they may have attained. In this respect, MCPs with fewer subscribers (in a balanced position) will

[164] This is on the assumption that it receives the same MTR as other operators. This is not currently the case but MTRs will be symmetric from 2011/12 onwards.
[165] Vodafone made this point in a presentation to Ofcom on 10 August 2010 following submission of its response to our April 2010 consultation.
[166] Paragraph 134 of O2's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/O2.pdf.
[167] Paragraph 1.23 of our November 2010 competition consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/mct-large-small/summary/mct-large-small.pdf.

neither be able to set prices as competitively as MCPs with a larger share of subscribers nor act as a competitive constraint on large MCPs.

A3.160 In summary, we consider that a MCP's retail pricing decision must take into account the cost of outbound calls and the price floor effect this creates, which is likely to limit MCPs incentives to compete as aggressively. We have compared the impact of reducing MTRs from the current level to the LRIC+ level in 2014/15. This substantially reduces the impact, but would not fully eliminate it, unless MTRs were set at pure LRIC. As noted above, MCPs may counter this effect by trying to attract a mix of subscribers that ensure they have a more balanced on-net and off-net traffic profile overall. However, such steps are likely to carry some costs in terms of the competitiveness of the retail packages marketed by the MCP seeking to achieve this.

A3.161 A further point made in H3G's response to our April 2010 consultation is that even if H3G were in a position to achieve a balanced traffic profile overall, this means it has to restrain its ability to compete for consumers with certain outbound/inbound calling ratios. Below we assess this effect in more detail.

Impact on different consumer segments

A3.162 One of the competitive distortions identified in H3G's response is that (in H3G's submission), high symmetric MTRs create a disadvantage for MCPs with fewer subscribers in competing for consumers which exhibit a particular traffic profile.

A3.163 If MCPs with fewer subscribers and with a balanced traffic position, attempted to price aggressively to attract consumers that are sensitive[168] to low (outbound) call prices, which are typically post-pay, (assuming their rivals do not change their prices in the short term) then:

3.163.1 these subscribers are likely to make many more outbound calls than receive inbound calls; and

3.163.2 most of the outbound and inbound calls will be off-net because of their smaller subscriber base.

A3.164 This means that if MCPs with fewer subscribers compete for these consumers, their wholesale costs (that is, their outpayments) would increase as such pricing strategies will tend to attract the consumers that make more calls (i.e. with a high outbound to inbound calling ratio). In order to mitigate this risk, MCPs with fewer subscribers will have more incentive to target certain type of consumers - i.e. consumers who make fewer outbounds call than they receive.

A3.165 By contrast, lower value consumers such as most pre-pay consumers, in general, may have a low outbound/inbound calling ratio. This can lead to net in-payments for MCPs with fewer subscribers. As a result (and all other things being equal) MCPs with fewer subscribers would be expected to have higher profit per subscriber[169] for such consumers than rivals with a higher subscriber share (due to the greater proportion of inbound minutes to these consumers that originate off-net).

[168] For example, in response to lower prices those that make the largest proportion of calls may be more willing to switch between MCPs.

[169] More specifically, we might expect that the average "contribution margin" per pre-pay consumer will be relatively higher for an MCP with fewer subscribers. See footnote 171 for a further description.

Information requests and our November 2010 consultation

A3.166 Having examined H3G's analysis and evidence on this point, we considered that, at least conceptually, there was merit in the argument that the combination of the level of MTRs and market share of subscribers may have an impact on competition for particular consumer segments.

A3.167 In light of this, we sought additional data using our statutory section 135 information gathering powers. We sent our request to the four national MCPs and ✂ on 17 September 2010, which included (among other things) a request for data on the inbound and outbound traffic profiles of different consumer segments (e.g. based on monthly spend and whether they were pre-pay or post-pay). Having considered the data submitted in response to our information request, we issued a consultation in November 2010, where we asked stakeholders to comment on our emerging thinking on this issue.[170]

A3.168 We sought to test whether the asymmetry in share of subscribers *in isolation* might have a material effect. In other words, our aim was to isolate the impact of these factors from other factors that may affect the MCPs' incentive to focus on particular consumer segments. We also presented data on actual outbound/inbound ratios for different MCPs and how these varied across consumer segments, drawn by expenditure on mobile services. We further indicated that as MCPs may offset the competitive disadvantage that they may face due to high MTRs by accepting lower contribution margins for specific customer segments, the inferences from the actual data need to be interpreted with care. [171]

A3.169 In our November 2010 consultation, we presented a simple spreadsheet model calculating a notional contribution margin per subscriber from M2M calls. The spreadsheet model was built to assess how the contribution margin per subscriber may vary for MCPs with different shares of subscribers for different customer segments, segmented into three illustrative groups:

- pre-pay (with an assumed outbound/inbound calling ratio below one);
- low-spending post-pay consumers (which we termed "post-pay low", with an assumed outbound/inbound calling ratio at one); and
- high-spending post-pay consumers (which we termed "post-pay high", with an assumed outbound/inbound calling ratio above one).

A3.170 As with any modelling exercise, our spreadsheet was a simplified representation of the world. Many other variables will affect the incentives of MCPs to compete in different consumer segments. We thus recognise that behaviour and market outcomes are not driven solely by the asymmetric shares of subscribers as indicated in stakeholders' responses.

[170] Mobile call termination: the relationship between mobile termination rates, market share and competition, Ofcom, 29 November 2010: http://stakeholders.ofcom.org.uk/consultations/mct-large-small/?showResponses=true

[171] We refer to this as a "contribution margin" rather than profit per subscriber as the latter would need to account for a number of other potential costs, such as costs from other non-modelled services, retail costs and overheads, and revenues from other services. The contribution margin modelled shows the difference between: (a) the assumed wholesale costs including an MCP's own incremental network costs of origination and termination for on-net calls and payments to other MCP plus origination costs for off-net M2M calls; and (b) the wholesale payments from other MCPs for inbound M2M calls.

Model outputs

A3.171 The results of this simple model updated with the pure LRIC and LRIC+ values derived in Section 9 are set out in Table A3.2 below based on current MTRs in 2010/11 and the and LRIC+ values in 2014/15 (in 2008/09 prices) as estimated by our 2011 MCT cost model.[172] If prices were set at pure LRIC in 2014/15, there would be no difference in the contribution margins for MCPs with different shares of subscribers. Therefore, we have not presented the pure LRIC scenarios for MCPs with difference shares of subscribers in the table below.

Table A3.2: Differences in average yearly contribution margin per subscriber between MCPs with different subscriber shares for different consumer segments (based on LRIC + based MTRs in 2010/11 and 2014/15)

	Difference in contribution margins for different pricing scenarios and shares of subscriber			
Consumer segment	LRIC + in 2010/11 (4.18 ppm)		LRIC + in 2014/15 (1.61 ppm)	
	5% versus 25%	1% versus 40%	5% versus 25%	1% versus 40%
Pre-pay	3	5	1	1
Post-pay high	-16	-31	-4	-8
Post-pay low	0	0	0	0
Weighted average	0	0	0	0

Source: Ofcom 2011. Base case assumptions: MTR = 4.18ppm (2010/11) and 1.61ppm (2014/15), marginal termination / origination costs = 0.69ppm. All prices in real 2008/09 terms.

A3.172 Table A3.2 shows the notional differences in contribution margins for MCPs with different shares of subscribers for each of the consumer segments we identified. Our model predicts that if a MCP achieved the same share of consumers across all segments, then, on average, it would obtain the same contribution margin per subscriber irrespective of its market share (i.e. there is no difference in the contribution margins calculated for 5% versus a 25% share of subscribers or 1% versus a 40% share of subscribers). This outcome should be expected as the model assumes that an average consumer makes as many calls as he or she receives.[173]

A3.173 The differences in contribution margins may disappear overall, but only where MCPs achieve the same share of subscribers in each consumer segment. This

[172] Throughout this exercise we assume that the underlying costs for terminating (and originating) a call is the pure LRIC estimate of 0.69ppm in 2014/15 (in 2008/09 prices).
[173] This assumption must hold for the mobile industry as a whole as the number of calls made must equal the number received.

condition is not reflected in today's market conditions. Table A3.2 shows that for "post-pay high" consumers the estimated difference in the average yearly contribution margin may be significant (using the current MTRs). A MCP with a 5% share has a relative potential disadvantage of £16 p.a. or £31[174] for a 24 month contract, compared to an MCP with a 25% share of subscribers. This grows to £31 p.a. or £61[175] for a 24 month contract when comparing MCPs with a 1% and 40% share of subscribers. As we assume that "post-pay low" consumers have an outbound/inbound calling ratio of one, high (symmetric) MTRs do not create any potential competitive distortions in this consumer segment (i.e. there are no differences at all in the contribution margins). For "pre-pay" consumers, MCPs with fewer subscribers have an apparent advantage (e.g. a 5% subscriber share MCP could in theory earn £3 more per annum compared to one with a 25% share). This grows to £5 when comparing MCPs with a 1% and a 40% share of subscribers. [176]

A3.174 In our second scenario (in the final two columns of Table A3.2 above), we consider the effect when the MTRs have been reduced to the LRIC+ estimate in 2014/15 (1.61ppm)[177] keeping all other assumptions in the model unchanged. MTRs set at LRIC+ in 2014/15 would significantly narrow the contribution margin differences per customer in the post pay high segment and would also essentially eliminate (in absolute terms) the per subscriber disadvantage in the pre-pay segment that we predict a MCP with fewer subscribers could have.[178] As noted in paragraph A3.171 above, moving to pure LRIC would eliminate any difference in the contribution margin for MCPs with different shares of subscribers.

A3.175 Figure A3.5 and Figure A3.6 below generalise the above discussion. They show how the yearly per subscriber contribution margin from M2M calls would vary with the MCP's subscriber share and its outbound/inbound calling ratio in the spreadsheet model using the values in 2014/15 (keeping all other modelling assumptions unchanged).

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[174] Over a 12 month period the calculated disadvantage to a MCP with a 5% share is rounded to the nearest pound (i.e. rounded up to £16). Over a 24 month period this rounds to £31.

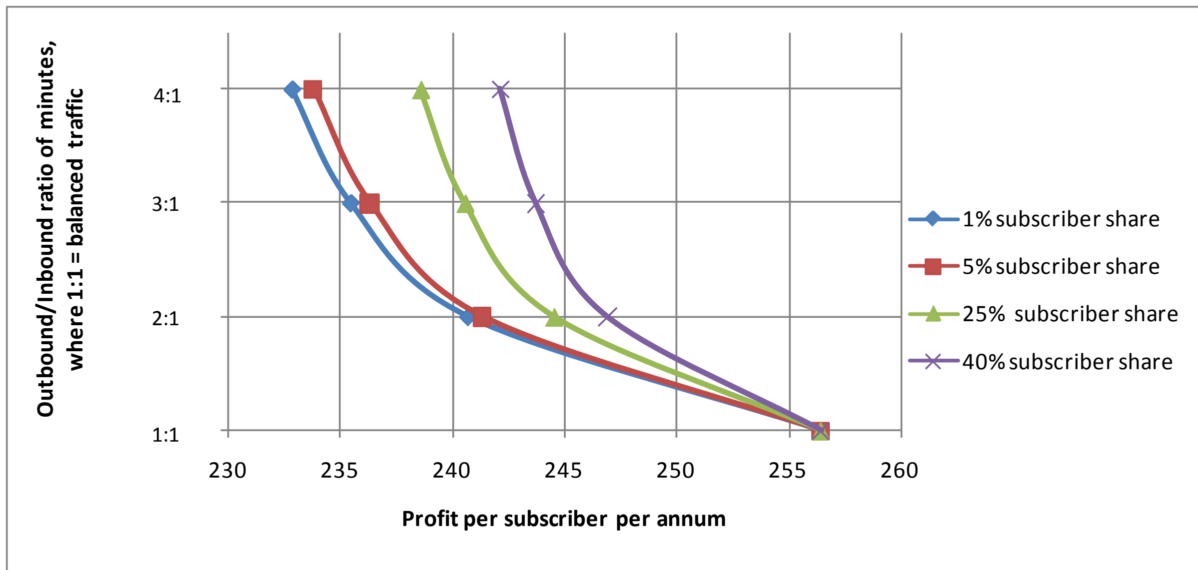
[175] Over a 12 month period the calculated disadvantage to a MCP with a 5% share is rounded to the nearest pound (i.e. rounded up to £32). Over a 24 month period this rounds to £61.

[176] In our November 2010 consultation we noted that MCPs competing in the UK have very asymmetric subscriber shares (paragraph 1.43 at http://stakeholders.ofcom.org.uk/binaries/consultations/mct-large-small/summary/mct-large-small.pdf). The merger of Orange and T-Mobile created Everything Everywhere, with more than a 40% wholesale share of subscriptions, while H3G's share has stabilised at 5% and we have recently seen the entry of new players, such as C&W (with shares below 1%). We note that Vodafone (see page 7 of its response at http://stakeholders.ofcom.org.uk/binaries/consultations/mct-large-small/responses/vodafone.pdf) was critical of our comparison of the contribution margin of an infrastructure operator with a 1% market share compared to a 40% market share. It did not see how we might argue that setting lower MTRs would be likely to enhance the ability or incentive of an infrastructure operator with a 1% share of subscribers to compete in the post-pay market. However, MCPs with fewer subscribers such as C&W have entered using their own infrastructure in certain locations and we consider that MCPs with fewer subscribers (i.e. with 1% market shares) are relevant to our analysis.

[177] In our November 2010 consultation, our LRIC + costs assumption for 2014/15 was 1.5ppm (pure LRIC of 0.5ppm). This would generate a difference in contribution margins for the post-pay high segment of £5 p.a. (for a 5% versus a 25% MCP) and £9 p.a. (for a 1% versus a 40% MCP). In each case, this is a difference of £1 p.a. compared to the corresponding values in Table A3.2 above.

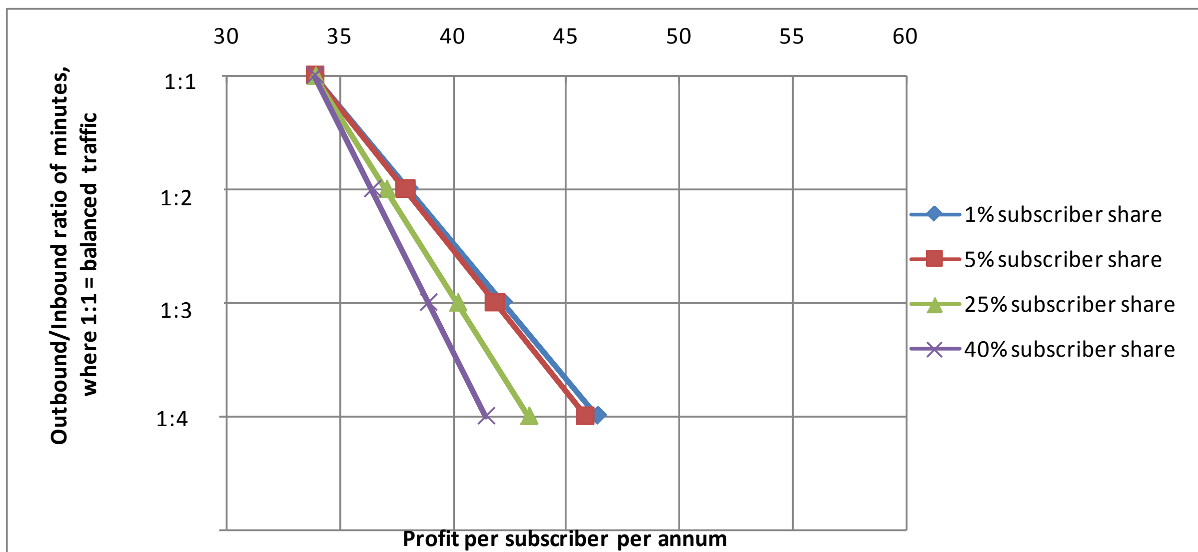
[178] The analysis suggests that in the high-end segment a MCP with 5% of subscribers would face a disadvantage of £4 per annum compared to a competitor with a 25% share of subscribers. Our spreadsheet model suggests that an operator with 1% share of subscribers would face a disadvantage of £8 p.a. per high end post pay consumer compared to an operator with 40% share (or £16 for a 24-month contract).

Figure A3.5: "Post-pay high" contribution margin per subscriber per annum by operator market share and for different outbound/inbound calling ratios



Source: Ofcom 2011 (2008/09 prices).

Figure A3.6: Pre-pay contribution margin per subscriber per annum by operator market share and for different outbound/inbound calling ratios



Source: Ofcom 2011 (2008/09 prices).

A3.176 Figure A3.5 and Figure A3.6 show that as the outbound/inbound calling ratio increases, the impact of high (symmetric) MTRs is to reduce the modelled contribution margin per consumer.[179]

[179] Vodafone commented (see pages 10 and 15 of its response at http://stakeholders.ofcom.org.uk/binaries/consultations/mct-large-small/responses/vodafone.pdf) that by using different outbound/inbound calling ratios in the model the stated size of any difference could be much smaller. We agree, as suggested in **Error! Reference source not found.** and **Error! Reference source not found.** above, that as outbound/inbound calling ratios converge to unity this will diminish the contribution margins in the three consumer segments identified. If consumers were more homogenous between segments then this would increasingly reduce the differences in contribution margins. However, as we discuss below, we gathered data using our statutory section 135 powers on outbound/inbound calling ratios which suggests that our assumptions were generally

Calibrating the model with actual data

A3.177 As set out in paragraph A3.167, we requested from MCPs and MVNOs information on the actual traffic profiles of different consumer segments.[180] In our November 2010 consultation we explained that using traffic data has substantial limitations, particularly as data may reflect efforts by MCPs to overcome any competitive disadvantages (potentially at some cost to them) and because of concerns over the quality of the data provided.[181] As a result of this we consider that we should not place too much emphasis on this exercise. Nevertheless, it is useful to summarise the available evidence on this issue.

A3.178 Responding to our November 2010 consultation, Vodafone criticised the reported volumes used in the calibration exercise. Since our November 2010 consultation, we have received the final set of data from some operators and having made further clarifications and analysis of their submissions, we have updated the volumes of inbound and outbound calls for each consumer segment.[182] This change reduces the significance of the results of the model published in our November 2010 consultation.[183] Nevertheless, the data tends to confirm that there are material differences in the outbound/inbound calling ratio across consumer segments.

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realistic. At the very least this suggests that non-insignificant differences exist in the consumer patterns by payment type (i.e. post-pay versus pre-pay).

[180] We asked for information on the relative balance of on- and off-net and out- and in-bound traffic for consumer segments with different expenditure profiles. We asked for volume data separated by pre-pay, post-pay and SIM only consumers for different groups of consumers depending on their monthly expenditure. We asked for the last 4 quarters for which the respondent had data, ideally covering the period Q3 (2009) to Q2 (2010).

[181] First, and most critically, actual traffic data reflects any attempt by an MCP – i.e. via their commercial strategy - to minimise the (wholesale) competitive distortions to offer competitive retail packages. Second, there have been difficulties in obtaining data which could be comparable across MCPs, in particular as some data was incomplete (i.e. some operators could not provide the data on inbound and outbound calls for each of the identified consumer segments (pre-pay and post-pay consumers broken down by monthly expenditure)). Third, many MCPs did not provide data consistent with our requested time period. Fourth, it is hard to isolate from the data received the precise effects on M2M competition given M2F and F2M are often included in the data and that there is not an easy way to separate these types of traffic. Many FCPs that interconnect with MCPs are also transit providers. In some cases, FCPs such as BT and C&W transit calls that originate on one MCP's network and terminate on another. Therefore, we cannot be sure that calls to (from) an interconnecting FCP would necessarily terminate (originate) on a FCP.

[182] Most of these further clarifications and analysis did not have a material impact on the numbers reported in Table 3 of our November 2010 consultation. However, our further analysis of the data from a major MCP highlighted an error, which had a larger impact on the average outbound and inbound volumes for different consumer segment. When we correctly adjusted for this, the most significant change relative to the data used in our November 2010 consultation) was to the average volume of calls to and from post-pay consumers. The adjusted data suggests an average volume of outbound calls of 260 compared to 411 outbound minutes in our November 2010 consultation. This does not fundamentally alter the outbound/inbound calling ratio (which is still marginally above 2 to 1 (2.2:1)). The revised data suggests that on average post-pay consumers make and receive fewer minutes of calls per month than was calculated in our November 2010 consultation. Although the figures for the pre-pay consumer segment have not changed as much, the revised data suggests the implied net inflow of calls to this consumer segment is smaller than assumed (i.e. on average traffic is almost balanced for pre-pay consumers (0.9:1)).

[183] As we noted in paragraph 1.48 of our November 2010 consultation (http://stakeholders.ofcom.org.uk/binaries/consultations/mct-large-small/summary/mct-large-small.pdf), these calibration data need to be carefully interpreted. There were a limited number of MCPs that provided sufficiently granular data for us to interpret the inbound and outbound traffic volumes and ratios for different expenditure cohorts within the pre-pay or post-pay segments with any

A3.179 We have run again our model in Table A3.3 based on the data we have received on traffic volumes and outbound/inbound call patterns of different consumer segments (and with our final values for pure LRIC and LRIC+). Unlike the theoretical model, we have only been able to look at two consumer segments: pre-pay and post-pay. We present two scenarios with LRIC+ respectively at current values of 4.18ppm in 2010/11 and at 1.61ppm in 2014/15.

Table A3.3: Indicative differences in contribution margin from calls per subscriber for different consumer segments, comparing pure LRIC and LRIC+ (based on LRIC + cost estimates in 2010/11 and 2014/15) (£ p.a.)[184]

	Difference in contribution margins for different pricing scenarios and shares of subscriber			
Consumer segment	LRIC + in 2010/11 (4.18 ppm)		LRIC + in 2014/15 (1.61 ppm)	
	5% versus 25%	1% versus 40%	5% versus 25%	1% versus 40%
Pre-pay	0	0	0	0
Post-pay high	-12	-23	-3	-6

Source: Ofcom 2010. Base case assumptions: MTR = 4.18ppm (2010/11) and 1.61ppm (2014/15), incremental termination /origination costs = 0. 69ppm. All prices in real 2008/09 terms.

A3.180 Table A3.3 suggests that using actual traffic data at current MTRs for post-pay consumer segments there are still some differences in contribution margins (i.e. £12 p.a. comparing MCPs with 5% and 25% subscriber shares and £23 p.a. comparing MCPs with 1% and 40% subscriber shares).

A3.181 These are smaller than suggested in our theoretical model. Lowering MTRs from the current level eliminates much of the difference in the contribution margin for post-pay. However, some difference would remain for the post-pay consumer segment (i.e. £3 p.a. for a 5% compared a 25% subscriber share MCP which would grow to £6 p.a. if comparing a 1% to a 40% subscriber share MCP). Moreover, our data show that some MCPs for some high-end consumer segments have a higher outbound/inbound calling ratio than the values used in the calibration exercise so for these consumer segments the effect would be more significant.[185] Adopting pure LRIC would remove the contribution margin difference associated with LRIC+ in 2014/15 (as shown in Table A3.3).

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confidence. We also noted in our November 2010 consultation that we were still clarifying with some individual stakeholders some final aspects of the data submitted, although we did not expect these clarifications to make a material difference to our analysis.

[184] In this table we do not show an overall weighted average that sums to zero as the model is not a "closed" model (i.e. it includes M2F and F2M volumes and hence the volume of inbound and outbound minutes are not the same). This differs from the outputs the presented in Table A3.2, which used only M2M minutes to generate the results, where the volume of inbound minutes equals the volume of outbound minutes.

[185] ✂

Stakeholders' views on the November 2010 competition consultation

A3.182 We received seven responses to our November 2010 consultation. H3G, C&W and SSE agreed that MTRs (above incremental cost) can distort competition. EE, O2, Virgin Media and Vodafone did not.

A3.183 H3G submitted[186] that MTRs above pure LRIC limit competition for certain groups of consumers (as suggested by our analysis in the November 2010 consultation). However, it also stressed[187] the importance of its argument that MTRs above pure LRIC act as a fundamental limit on the degree of price competition across all MCPs irrespective of size (this specific concern was discussed in detail in paragraphs A3.139 to A3.161 above). Nevertheless, it agreed that MTRs above pure LRIC did make it difficult to compete for high-end consumers because they have on average high outbound/inbound calling ratios. It provided confidential evidence from previous attempts to target high-end segments when it first entered the market. It also provided more recent confidential evidence[188] on the effects of recently launched post-pay contract plans (this is discussed in more detail in paragraphs A3.222 to A3.224 below). H3G submitted that our spreadsheet model may understate the competition effects.[189]

A3.184 SSE also submitted[190] that it considered there to be a risk of anti-competitive effects of high MTRs. It agreed that the analysis appeared to show a systematic competitive distortion in terms of off-net call costs. It noted that this effect would be seen to a lesser extent if MTRs were lowered to the estimates of LRIC+ (as presented in our November 2010 consultation), but it supported the removal of the identified distortions. C&W agreed[191] that MCPs with the highest share of subscribers appeared to have an advantage when competing for high value consumers. Indeed, it considered that attracting the high value consumers is essential for any MCP to build a significant market share. C&W also noted that the highest value consumers will also be the ones that spend the most on other value-added services. C&W submitted that if the contribution from these services is significant then it will be impossible for MCPs with fewer subscribers to make up for a lack of high value customers by increasing its share of lower value customers (where it may have a small relative advantage based on Ofcom's analysis). C&W noted that pure LRIC is the best way to avoid the identified distortions between MCPs with different shares of subscribers and also between MCPs and FCPs.

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[186] Paragraph 8 of H3G's response to our November 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/mct-large-small/responses/h3g.pdf .

[187] Paragraph 12 of H3G's response to our November 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/mct-large-small/responses/h3g.pdf

[188] Paragraph 40 of H3G's response to our November 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/mct-large-small/responses/h3g.pdf .

[189] It argued that the assumption that all MCPs have the same average retail price (regardless of market share) and all MCPs have the same call volumes and calling balance for a particular type of subscriber were not compatible where on- and off-net price discrimination exist. This is because as consumers of MCPs with fewer subscribers pay the (higher) off-net price on a higher proportion of calls, the only way for these MCPs to match the average retail price of a MCP with a large share of subscribers is for it to charge lower retail on-net and off-net retail prices. Hence, in order to compete, MCPs with fewer subscribers must set lower retail prices. Attempts to reduce call prices are likely to lead to an increase in the outbound/inbound calling ratios and higher net outpayments. This margin shortfall is higher the higher are MTRs and it disappears only under pure LRIC.

[190] SSE's response to our November 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/mct-large-small/responses/sse.pdf.

[191] C&W's response to our November 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/mct-large-small/responses/c-w.pdf.

A3.185 EE, O2, Virgin Media and Vodafone did not agree that the risk to competition as presented in the model was either valid and/or material. In addition to a number of detailed comments about the model assumptions and data used (partially discussed above) their key submissions were that:

3.185.1 the model's predictions ran counter to academic research;

3.185.2 the predictions of our theoretical model did not stand up to scrutiny against the currently available empirical evidence;

3.185.3 even if the model were correct MCPs with fewer subscribers could mitigate any predicted competition effects; and

3.185.4 even if the model were correct the overall materiality of the calculated differences in contribution margins between MCPs with different subscriber shares were too small to matter.

Academic papers on mobile to mobile competition

A3.186 Vodafone argued that academic papers by Gans and King (2001)[192], Carter and Wright (2003)[193] and Armstrong and Wright (2009)[194] suggest that lower MTRs reduce competition among MCPs which is contrary to what we argue.[195] In particular, Vodafone argues (as we understand it) that low (i.e. below cost) MTRs make networks with fewer subscribers more attractive to consumers (as it would be cheaper to call off-net than on-net). If this is the case, networks would not want to grow their share of subscribers as this would make them less attractive to consumers. This in turn would dampen retail competition.

A3.187 Care should be taken, in our view, in drawing broad policy conclusions from these papers, given that the results are driven by specific assumptions which do not accurately describe the current or future UK mobile market:

3.187.1 the result in Gans and King that MCPs, if they co-operated (i.e. decided to jointly set their MTRs), would prefer to set MTRs below costs, breaks down if the model also includes fixed networks and, hence, F2M calls (as shown by Armstrong and Wright). When revenues from F2M calls are brought into the model MCPs would (if they could co-operate) prefer to set MTRs above costs.

3.187.2 The argument put forward by Vodafone also runs counter to the view shared by Ofcom (and our predecessor Oftel), other European NRAs, the CC, and the EC. All of these regulators have consistently agreed that MTRs, if unregulated, would be set above costs. It would also appear unclear why Vodafone would oppose reductions in MTRs if that led to a reduction in the intensity of competition and hence to higher profits.

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[192] Gans, J.S. and King, S.P. (2001), "Using 'Bill and Keep' Interconnect Arrangements to Soften Network Competition", *Economics Letters*, 71, 413-420.

[193] Carter, M. and Wright, J. (2003), "Asymmetric Network Interconnection", *Review of Industrial Organisation*, 22, 27-46.

[194] Mark Armstrong & Julian Wright, (2009) "Mobile Call Termination," Economic Journal, Royal Economic Society, vol. 119(538), pages F270-F307, 06 available at http://else.econ.ucl.ac.uk/papers/uploaded/255.pdf.

[195] Page 3 of Vodafone's response to our November 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/mct-large-small/responses/vodafone.pdf .

3.187.3 The papers also assume that MTRs below cost lead to off-net retail call prices that are below on-net retail prices. First, MTRs set at pure LRIC should not be interpreted as being "below cost".[196] Second, we expect, as discussed in Section 7, that under pure LRIC, fixed charges (in some form) will become more prominent compared to call prices. Therefore, call prices may become a less important tool than fixed charges for MCPs to attract subscribers. We also note that even in countries where MTR are set at or close to zero, such as in the US, there is no evidence of off-net call prices being below those on-net.[197] This means that call prices would be a less important tool to attract subscribers, contrary to what is assumed in the papers.

A3.188 Vodafone also referred to the Armstrong and Wright (2009) paper. Their paper builds on the two papers mentioned above by moving away from the assumption that networks are symmetric in their share of subscribers. In the presence of asymmetries, they conclude that the standard result (with non-linear pricing) that networks are indifferent to the level of their reciprocal MTRs, no longer holds. They claim that under asymmetric subscriber shares the larger network would prefer the reciprocal MTRs to be set at cost while smaller networks would prefer either below or above cost MTRs depending on their net traffic flow. Hence, we do not believe that their conclusions support the proposition that lower MTRs dampen retail competition between MCPs.

A3.189 EE also cited working papers by Jullien, Rey and Sand-Zantman (2009)[198] and Sauer (2010)[199], which it considered showed that on-and-off net price discrimination is pro-competitive and increases consumer welfare where consumers are segmented and usage patterns differ.[200] Again, an analysis of the underlying assumptions shows that it is inappropriate simply to refer to the results from these stylised models to make inferences about the correct form of MTR regulation in the UK market.

3.189.1 Jullien, Rey and Sand-Zantman (2009) assume that consumers (light and heavy users) have heterogeneous calling patterns/demand elasticities. They find that MCPs would prefer MTRs above cost because light users (who mostly receive calls) are more profitable when MTRs are above

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[196] Further, these papers do not always refer to pure LRIC as the measure of costs. For example, in Armstrong and Wright (2009), they denote the mark-up in termination rates over costs as (*a-CT)*, where "*a"* is the MTR (for M2M traffic) and "*CT"* is the marginal cost of termination. Therefore, below cost MTRs in this paper refers to charges below marginal cost. In these papers, pure LRIC would therefore represent a mark-up over termination costs.

[197] In its response to our November 2010 consultation, EE submitted that on-net call prices are still cheaper than off-net call prices in the US (despite MTRs being close to or zero). In Annex 9, paragraphs A1.24 to A1.25 of the May 2009 consultation, we noted that in the US most post-pay tariffs (and some pre-pay tariffs) offer unlimited on-net calls. Once the allowance of off-net calls is used up, there is an effective difference in prices of on-net calls (which are always free) and off-net calls (charged at a flat rate beyond the allowance). In reality though, the bundle sizes are so large that off-net calls are effectively unlimited for a large number of consumers. Therefore, the difference in the price of on-and off-net calls is close to zero for most users.

[198] Jullien, B., Rey, P., and Sand-Zantman, W. (2009) "Mobile Call Termination Revisited", IDEI Working Papers 551, Institut d'Economie Industrielle (IDEI), Toulouse.

[199] David Sauer (2010), "Welfare implications of on-net/off-net price discrimination", Toulouse School of Economics, 2 November 2010.

[200] Page 5 Of EE's response to our November 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/mct-large-small/responses/everything-everywhere.pdf.

cost.[201] They find that the welfare maximising MTR is also above marginal cost, but below the profit maximising level (although a finding of a positive welfare impact of a small MTR mark-up rests on the presence of light users who are highly sensitive to the price of a subscription).[202] We consider, however, that this model is not easily applicable to the UK situation.[203]

3.189.2 The focus of the Sauer (2010) paper is whether consumers and society overall are better-off with or without discrimination in retail on-and off-net prices. This paper does not therefore inform our choice of the optimal regulated MTR, which is taken as given in the model (i.e. it is assumed to be set by regulation). Sauer argues that with a positive mark-up on MTRs, price discrimination is beneficial to consumers (although in most cases it is not beneficial to total welfare overall) – as it allows MCPs to reduce the average price of calls.[204] The main scenario where the benefits of on-and off-net price differentials enhance consumer surplus and total welfare rest on the benefits of market expansion (i.e. assuming the size of the market is not fixed).[205] However, this result is perhaps less applicable to the current situation in the UK, which may have already reached maturity in terms of the number of subscribers.

Comparison of the model's predictions to empirical evidence

A3.190 O2[206], Vodafone[207] and ✂ each submit that there was no evidence of significant barriers to competition as the UK retail mobile market was already competitive (as concluded by the EC in its decision on the T-Mobile/Orange merger in March 2010).[208] They also commented that the model's predictions were not supported by H3G's position in the market.[209] Some commented that it was more likely that

[201] Although the opposite result can arise, especially if networks can set different prices for on-and off-net calls.
[202] In the model, such elastic demand brings about increased participation, which brings network benefits – for example due to increased calling opportunities for all users. However, if this elasticity assumption were relaxed then the welfare maximising MTR would be a mark-up on costs of zero.
[203] For example, they conclude that MCPs are likely to favour higher MTRs for light users, however, they do not consider heavy users making more outbound than receiving inbound calls (i.e. equivalent to our "post-pay high" segment). They also do not consider how the subscribers' share of a MCP may impact the results.
[204] The benefit to consumers arises because although there is an increased MTR (and the price of off-net calls rises), there is a positive effect on consumer surplus due to the lower price of on-net calls and fixed subscription fees.
[205] This is expressed as the number of subscribers to the network, see page 15, Section 5.4 of Sauer (2010).
[206] Paragraph 18 of O2's response to our November 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/mct-large-small/responses/o2.pdf
[207] Page 2 Of Vodafone's response to our November 2010 at http://stakeholders.ofcom.org.uk/binaries/consultations/mct-large-small/responses/vodafone.pdf.
[208] http://ec.europa.eu/competition/mergers/cases/decisions/M5650_20100301_20212_247214_EN.pdf
[209] These stakeholders argued that the model predicts that H3G would have a relative advantage for pre-pay consumers and a relative disadvantage for post-pay high consumers, which was not reflected in its current market position. This evidence, they argued, contradicted the results of the model. Vodafone noted, at pages 1 to 2 of its response to our November 2010 consultation (http://stakeholders.ofcom.org.uk/binaries/consultations/mct-large-small/responses/vodafone.pdf), that contrary to the model's predictions, the EC also found the national MCP with the fewest subscribers, H3G, to have the most competitive rates for long-term post-pay and business consumers and O2, one of the MCP with the larger share of subscribers, to have the most competitive pre-pay rates. H3G has a much stronger presence in the post-pay market than it does in the pre-pay market. O2 also pointed

H3G's commercial strategy was the main reason it had failed to increase its share of subscribers, rather than competitive distortions due to high MTRs and an asymmetric share of subscribers. EE pointed[210] to other MCPs with few subscribers, such as Tesco Mobile and Virgin Media, which had been able to attract subscribers.[211] O2 also noted that the model would tend to predict that EE would have received a competitive boost post-merger for post pay high-end consumers and there was no evidence of that to date.[212] EE argued that rather than seeking to set MTRs to support MCPs such as H3G, Ofcom should base its decision on clear evidence that the envisaged reductions in MTRs would enhance consumer welfare.

A3.191 Our starting point is that we are considering here the question of whether the choice of one cost standard and not another would promote competition. There are many other factors that also affect competition among MCPs, including the availability of spectrum, incumbency advantages, and advertising sunk costs that create brand value. The difficulty in pointing to the market position of a particular operator (such as H3G) as contradicting the predictions of the model is that many other factors impact on its and other MCPs' commercial position.[213]

A3.192 Contrary to stakeholders' views, our objective is not to enhance H3G's (or any other MCPs') commercial prospects. The proper concern of a regulator relates to the presence of barriers to competition and ensuring that opportunities for expansion are available to all MCPs based on their market performance (as one dimension of a wider effort to 'promote competition'). The main question is whether higher MTRs

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to H3G's aggressive competition for high-end consumers as undermining the predictions of the theoretical model. Further, O2 noted that H3G has conceded that 3G handset costs are no longer higher than 2G handsets and, hence, no longer preclude H3G from competing for pre-pay consumers (paragraphs 12 to 16 of O2's response to our November 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/mct-large-small/responses/o2.pdf).

[210] Page 4 Of EE's response to our November 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/mct-large-small/responses/everything-everywhere.pdf.

[211] EE highlighted that as the majority of consumers were on pre-pay tariffs, the advantage of MCPs with fewer subscribers in this segment implied that high MTRs do not constrain, and actually support, their ability to grow. EE thought that the model results showed how entry in the pre-pay segment could be used as a stepping-stone to attract subscribers, such that differences in any consumer segment become insignificant.

[212] At paragraphs 17 to 19 of its response to our November 2010 consultation (http://stakeholders.ofcom.org.uk/binaries/consultations/mct-large-small/responses/o2.pdf), O2 noted that if MCPs with a large share of subscribers enjoyed a comparative competitive advantage then this would suggest that the recent merger of T-Mobile and Orange would have provided them with a "shot-in the arm". O2 argues that there is not any evidence of EE enjoying a significant and instantaneous competitive advantage in competing for post-pay high end consumers. O2 notes that had such a benefit been significant, the EC would have commented on it in its decision on the merger. Vodafone made a similar point that the EC had found the UK mobile market to be very competitive and Ofcom had not raised the particular concerns (to the EC) over asymmetric market shares it is now advancing.

[213] The problem with taking a snapshot of a particular MCP such as H3G is that many other factors, in addition to the level of MTRs, impact on retail outcomes in the UK. In addition, under previous and current charge controls, H3G has had an asymmetric MTR (i.e. higher than the charge controlled for other MCPs), though the asymmetry has been reduced over time. O2 also argued that the model would predict that EE should receive a competitive boost from its merger. However, as we discussed in paragraphs A3.191 above, there are many factors that affect the competitive retail market outcome. Furthermore, as the merger was only completed in mid-2010, it is too soon to discern the market outcome and in any case any such advantage may not be detectable against other market factors.

(for example, set at LRIC+) would harm or reduce competition among MCPs. Our objective in developing the model was to isolate and assess the potential competitive impact of just one of the factors of interest in this market review - i.e. the impact of the level of MTRs under pure LRIC and LRIC+ when market shares are asymmetric and outbound to inbound calling ratios vary.

A3.193 In respect of EE's comment that MCPs with fewer subscribers could still successfully compete for the pre-pay segment and gain share of subscribers, our modelling shows that this may be correct (other things equal), but that the absolute advantage they have seems more limited.

A3.194 It is true, as pointed out in O2 and Vodafone's submissions, that the EC did not raise competition concerns in its recent merger assessment.[214] We do not agree that this implies that we should exclude the possibility that our concerns, expressed in the November 2010 consultation, are well-founded. The context and objectives of merger analysis are different from those of a market review; the EC's merger assessment considered the effects of the merger of T-Mobile and Orange, *taking the current MTR regulation as given*.[215] In this market review, we are (at this point) solely focused on the relative merits of different cost standards, including the effects of pure LRIC and LRIC+ on the promotion of competition.

A3.195 Having considered the submissions received, and the updated picture that emerges following adjustments to calibrate the model more closely with available market data, we conclude that, at the very least, the underlying intuition of the model appears valid in that the empirical evidence provided by stakeholders suggests that different consumer groups are not homogenous in terms of their outbound/inbound calling ratios. Post-pay consumers are likely to generate a net outflow of calls (which is likely to disadvantage MCPs with fewer subscribers to some degree, especially under values of LRIC+ with high contributions to common costs).

A3.196 Stakeholders' responses seem overall to agree that there may be an effect. The remaining empirical question is: how important is this effect? This point needs to be considered in light of the two remaining issues raised in submissions:

3.196.1 if the effect exists can MCPs employ strategies to mitigate the effects? And

3.196.2 would this effect be material enough to meaningfully inform our choice between pure LRIC and LRIC+?

Mitigation strategies

A3.197 EE, O2 and Vodafone submit that MCPs with fewer subscribers should be able to counter the competition disadvantage arising from net outflows of calls that are off-net by attracting groups of consumers within calling circles (formerly termed closed-

[214] http://ec.europa.eu/competition/mergers/cases/decisions/M5650_20100301_20212_247214_EN.pdf

[215] The EC's decision noted that "the market for the provision of wholesale mobile and fixed call termination services is subject to regulatory analysis by national regulators, in order to ensure that access is granted on reasonable conditions preserving effective competition. Therefore, given that termination tariffs are regulated, it is ensured that the mobile and fixed termination rates remain reasonable and non-discriminatory." (paragraph 176, page 30 at http://ec.europa.eu/competition/mergers/cases/decisions/M5650_20100301_20212_247214_EN.pdf).

user groups).[216] If MCPs with fewer subscribers were able to target calling circles, they argue, this would reduce their competitive disadvantage.

A3.198 This strategy may mitigate any competitive disadvantage and be most successful where MCPs can target this particular sub-set of consumers by offering tariff for members of calling circles. In the case of MCPs with fewer subscribers, they need to be able to do so without attracting other consumers that make a larger proportion of off-net calls.

A3.199 In theory, attracting calling circles (partially or even wholly) offset the impact on competition of MTRs above pure LRIC. However, the evidence does not seem to suggest that this mitigation can completely alleviate the competition concern. For example, it is not clear that this is likely to be a successful and credible strategy for MCPs with fewer subscribers because:

3.199.1 MCPs with a larger share of subscribers would have similar incentives;

3.199.2 Attracting calling circles may be difficult in a mature retail market. For example, it would require all members of the calling circle to coordinate to switch network. Membership of different calling networks seems likely to be at least partially overlapping. This may require a MCP to attract multiple and not single calling circles. As mentioned above, a MCP still needs to attract calling circles without attracting too many consumers with a high outbound/inbound calling ratio; and

3.199.3 As MTRs fall (and differences in on-net/off-net prices become less relevant) calling circles become less relevant to the consumers' choice of MCP.

A3.200 The available empirical evidence on the importance and relevance of calling circles points in different directions. Empirical analysis presented in a paper by Birke and Swann (2006a)[217] found that the main determinant of a subscriber's choice of MCP was the choice of other household members. In addition, they found that where on- and off-net retail price differentials are large, consumers are more likely to coordinate their subscription decisions.[218]

A3.201 The data contained in the Birke and Swann (2006a) paper uses two sources: market-level data provided by Ofcom and micro-level data on consumers' usage of mobile telephones from three UK household surveys in 1998, 2000 and 2001 (which we consider to be too out of date to draw strong policy inferences today). Vodafone explained that its own internal policy paper on on-net calling referred to a later paper by Birke and Swann (2007) – albeit one drawing on the same research as contained in their 2006 paper - where they explain that ten million subscribers to

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[216] Calling circles might be viewed as a network of friends, family or business colleagues whose calls account for the majority of calls made by users within that group.

[217] Birke, D. and G. M. P. Swann (2006a) "Network effects and the choice of mobile phone operator", Journal of Evolutionary Economics, 16, pp. 65-84.

[218] In a later paper, Birke and Swann also test the degree of mobile operator coordination of some student groups in UK, Italian, Dutch and Malaysian universities. This research was undertaken through surveys that, among others, asked students to state the other class members they communicated with. They find that, where an on-/off-net price differential exists, students tend to co-ordinate their subscription decisions. On the other hand, in the Netherlands, where there was no on-/off-net price differential at the time, coordination was found not to be very important. For more detail, see Birke, D. and Swann, G. M. P. (2006b), "Network Effects, Network Structure and Consumer Interaction in Mobile Telecommunications in Europe and Asia", mimeo, available at https://editorialexpress.com/cgi-bin/conference/download.cgi?db_name=res2007&paper_id=324.

a network have the same impact on consumer choice as one additional member from the same household being on the same network).[219]

A3.202 In addition to this evidence, Vodafone also submitted[220] that mobile business contracts are likely to attract a number of inter-business calling. Vodafone noted that for residential consumers, calls are most often made to family and friends.

A3.203 Our market research, as set out in our April 2010 consultation,[221] suggested that the MCPs of close friends and family was often *not* a driver of a consumer's choice of their own MCP.[222] We note that the fact that friends and family are likely to call each other with the greatest frequency does not necessarily mean that this would be the only factor affecting their choice of MCP or that consumers necessarily coordinate those choices. Indeed, the different results from Birke and Swann (2006a) and our own research (in 2009) are likely to reflect the different importance of this factor over time as the retail prices and offers vary in the marketplace and the market develops – most pertinently, the reduction over time of differences between on- and off-net call prices. Moreover, to the extent that calling circles still play a role in retail competition, we believe that this may represent a disadvantage for new entrants and smaller players as individual subscribers in a mature market will be less willing to switch to new entrants unless the other members of their calling circle also switch, but this is likely to be difficult to coordinate as calling clubs in practice may only partially overlap.

A3.204 O2, in its response to our April 2010 consultation,[223] cited the experience of One2One (later T-Mobile) and Orange which quickly increased their shares of subscribers following entry. O2 submitted that this provided evidence that MCPs with fewer subscribers do not face a competitive disadvantage even under higher MTRs than those that are currently in place. EE submitted that smaller operators were the first to introduce discounted on-net calling and such pricing was a feature of European mobile markets throughout the period when these markets were becoming more competitive.[224] (Presumably this was as a means to attract calling circles and to help generate greater numbers of on-net calls).

A3.205 The market and regulatory context when Orange and One2One entered is very different from that seen today. For example, when those MCPs entered, take-up was low and grew substantially since their entry. Consumer acquisition is easier in a growing market (where competition is for new and existing customers) than in a mature market (where growth has declined and MCPs are focused on retaining their

[219] Vodafone paper available at: http://www.vodafone.com/content/dam/vodafone/about/public_policy/policy_papers/public_policy_series_8.pdf and Birke, D. & Swann, G.M.P. (2007) 'Network Effects in Mobile Telephony', in Benzoni, L. & Geoffron, P. (eds.) A Collection of essays on Competition and Regulation with Asymmetries in Mobile Markets.
[220] Page 5 of Vodafone's response to our November 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/mct-large-small/responses/vodafone.pdf.
[221] See paragraphs A4.78 to A4.81 at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/annexes/wmvct_annexes.pdf.
[222] Research carried out by Jigsaw Research for our May 2009 consultation suggests that only 7% of respondents chose their network because friends/family were on that network as well (see Annex 10.2 of our May 2009 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/mobilecallterm/annexes/annex10_2.pdf).
[223] Paragraph 138 of O2's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/O2.pdf.
[224] Paragraph 122 of EE's response to the April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Everything_Everywhere.pdf.

existing customers and encouraging their rivals' customers to switch)[225]. In contrast to H3G and other more recent entrants, Orange and One2One could also compete more effectively as they could focus on the pre-pay segment where high MTRs act as a benefit for MCPs with fewer subscribers. Indeed, the evidence available shows that Orange and One2One benefitted from the growth in pre-pay customers.[226] In addition, Orange and One2One when they entered were able to set their MTRs at a higher level than Vodafone and BT Cellnet (now O2).[227] Therefore, given the different market circumstances facing new entrants today compared to when Orange and One2One first entered, we do not draw the same conclusions from this example as EE does.

A3.206 To assess the available evidence on the importance of calling circles, we asked for further information and evidence from MCPs using our statutory section 135 information gathering powers.[228] One respondent, ✂, provided some data, which suggested:

- A high proportion of calls are made to a few numbers;[229]
- this tendency decreases as consumers spend more – consumers with higher monthly expenditure tend to call a wider range of numbers;
- the proportion of calls within calling circles that are on-net seems to be invariant to the level of expenditure (between 30% and 35%); and
- there is some potential coordination of choice of network for the most frequently called numbers (i.e. for the most frequently called number this is more likely to be an on-net call on average than, say, for the ten most frequently called numbers). But this is not a very strong effect (i.e. 30% of calls on-net on average for the ten most frequently called numbers relative to around 35% of calls on-net for the most frequently called number).

A3.207 ✂ and ✂ also provided some information in response to our statutory information requests under section 135 of the Act that seem to provide similar results.[230] ✂

[225] For discussion of product life cycles see for instance pp. 231-232 of "Marketing Strategy", Ferrell and Hartline, 4th edition.
[226] See for example discussion of Orange and One2One's entry and reasons for rapid growth at paragraph 3.6 in: http://www.oft.gov.uk/shared_oft/reports/comp_policy/oft655aannexec.pdf
[227] See for example Figure 7, page 12 of the May 2009 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/mobilecallterm/summary/mobile_call_term.pdf, which shows MTRs payable by BT to T-Mobile (One2One) and Orange were in excess of those of Vodafone and O2 (Cellnet) in particular from 2000 to 2004 and remained above Vodafone's and O2's thereafter.
[228] Our initial request was for information on how often callers on their network make a call to their most called number and what proportion of these calls were on-net. Apart from one respondent, MCPs were not able to provide information in this form. Therefore, in our information request we also asked for any research or data that they held on the importance of calling circles. See Annex 4.
[229] The data suggests that the proportion of call minutes to the most frequently called number to total call minutes was about 50% for the lowest spending consumers and around 40% for the highest spending. See Annex 4.
[230] For example, a small sample of data from another respondent, ✂,suggested that approximately a quarter of outbound calls were made to a single phone number. The most frequently called three numbers accounted for around 50% of total outbound calls and the top ten numbers accounted for around 75% of customers' outbound calls. This data suggests that the most called numbers account for a smaller proportion of call minutes per month than was suggested in the case of ✂ as described

A3.208 This evidence suggests that calling circles are likely to exist to some extent and have some impact on the proportion of calls that are on-net. Indeed, we note that while H3G's subscribers' share✂, the proportion of outbound minutes that are on-net is higher (on-net calls accounted for roughly ✂of H3G's M2M outbound calls in 2009/10). This suggests that it must have had some success in attracting consumers with friends and family on the same network. What we have not been able to assess is the cost that H3G may have incurred in order to try to internalise the outbound calls to ensure a larger proportion of calls stay on-net.

A3.209 The more effective a MCP is at attracting calling circles, the weaker would be the competition impact we have identified. But while calling circles may mitigate to some degree the impact of higher MTRs, there is little evidence to suggest that they would eliminate it. In a market with more limited growth opportunities the presence of calling circles may mean that those consumers have already organised themselves onto the same network. This may make it more difficult for MCPs to attract new subscribers unless they can win the entire calling circle (or the most important members of that circle) as argued by H3G.[231]

Materiality

A3.210 EE, O2 and Vodafone also questioned the materiality of the estimated differences in contribution margins between MCPs (with different shares of subscribers) produced by our theoretical model.

A3.211 Vodafone questioned[232] whether the results presented under our theoretical model using proposed values of LRIC+ would be material in absolute terms (particularly where alternative assumptions on the outbound/inbound ratios are used).[233] Vodafone submitted that there are "alternative reasonable inputs" which could result in MCPs with fewer subscribers generally having a margin advantage across all consumer segments. It argued that, as the possibility of a reversed conclusion exists, the model should not have any weight in the choice between LRIC+ or pure LRIC.

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above. Nevertheless, the overall insight appears to be that the most frequently called numbers are still a significant proportion of total call minutes per month.

[231] H3G has previously argued that the effect of calling circles is to create a barrier for consumers' switching (this argument was set out in a H3G response to a June 2009 consultation by Consumer Focus) *"The current regime incentivises incumbent operators to construct tariffs which create calling circles and drive on-net usage that smaller operators cannot compete with on a level playing field. If flat rate tariffs could be introduced following a change to the wholesale arrangements in place, providers would be forced to innovate to compete and to focus on the quality of their service provision in order to differentiate themselves in the market. More transparent flat rate pricing would therefore drive down the overall level of retail prices and lead to competition in these other dimensions which would bring direct consumer benefit."* Paragraph 14 at http://www.consumerfocus.org.uk/assets/1/files/2009/11/H3Gconsultationresponse.pdf.

[232] Page 6 Of Vodafone's response to our November 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/mct-large-small/responses/vodafone.pdf.

[233] See the Annex to its response to our November 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/mct-large-small/responses/vodafone.pdf. Vodafone argued that our theoretical model's outputs for post-pay consumer segments would result in only small differences in the estimated contribution margin between MCPs with different shares of subscribers. It quoted our statement in the November 2010 consultation that such differences could be "too small to actually make a significant difference in (an operator's) ability to market to and induce such subscribers to switch to it." In the light of this, Vodafone questioned the materially of the contribution margin difference for high-end consumer segments under LRIC+.

A3.212 EE submitted that if we were to consider the differences in the contribution margins relative to the sales value of pre-pay and post-pay consumers (rather than in absolute terms), this would suggest a similar relative advantage in the pre-pay segment for MCPs with fewer subscribers as MCPs with a larger share of subscribers might enjoy for post-pay.[234] EE argued that given the greater price sensitivity of pre-pay consumers any differences would have a larger impact on pre-pay behaviour.

A3.213 O2 submitted[235] that in net present value terms the revenue shortfalls implied by the theoretical model would be immaterial in the context of the cost of entry of a MCP entering and gaining an equal market share as the incumbents over a 5 year period.[236] O2 also noted that the model predicted that even where there is a difference in contribution margins, post-pay high consumers are still significantly more attractive to all MCPs irrespective of their share of subscribers. This is because the post-pay high-end segment provides double the contribution of the post-pay low-end and four times that of a pre-pay consumer. In O2's view, this provides a strong rationale for all MCPs to compete vigorously, as they currently do. In addition, O2 noted that the post-pay high-end segment comprises customers to which other services such as data, SMS, roaming and international calls can be offered. The inclusion of these revenues would diminish the significance of the results of Ofcom's theoretical model.

A3.214 We do not agree with Vodafone's view that all of the assumptions it uses are "reasonable alternative assumptions". For example, to generate the result where MCPs with fewer subscribers achieve a higher contribution for the post-pay high-end segment, Vodafone assumes that MCPs with fewer subscribers have incremental costs that are half that of a MCP with 25% share subscribers.[237]

A3.215 Nevertheless, as set out in paragraphs A3.177 to A3.180, we have updated our analysis since our November 2010 consultation based on an updated assessment of MCPs' data on volumes by consumer segment and our revised estimates of pure LRIC and LRIC +. Our updated analysis continues to predict differences (in

[234] Page 3 of EE's response to our November 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/mct-large-small/responses/everything-everywhere.pdf.

[235] Paragraphs 28 to 36 Of O2's response to our November 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/mct-large-small/responses/o2.pdf.

[236] O2 calculated that the potential shortfall that an entrant might face based on the theoretical competition effect might amount to a £3 million revenue shortfall in net present value terms relative to an incumbent (this assumes that the MCP enters, competes with four incumbents and achieves 25% share within 5 years). O2 argued that this £3 million revenue shortfall should be seen in context of other sums, such as the cost of entering the market, the cost of operating at a relatively inefficient scale, subscriber acquisition costs and other activities to enhance the value of customers (such as reducing churn). It considered that a value of £3 million is not significant. O2 further noted that the model predicts that if MTRs were set to a level of LRIC+ of 1.7ppm (in 2014/15) (based on its estimate of LRIC+ for an operator with 25% market share) then the total shortfall would be £0.9 million on a net present value basis, which is trivial in the context of a decision whether to enter the market.

[237] Vodafone argues that for an operator with 5% of the customer market, rather than 25%, traffic levels must by definition be 5 times lower – as a consequence it is likely that such an operator would have no need of any incremental radio network asset expenditure (page 12 of Vodafone's response to the November 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/mct-large-small/responses/vodafone.pdf). However, we think that it is unrealistic to assume that MCPs with fewer subscribers and hence lower traffic would necessarily enter with full national coverage. Moreover, where they do, coverage is likely in the first instance to be provided by national MCPs and if the latter are capacity constrained, then the wholesale roaming rates would be expected to reflect such capacity constraints experience by the incumbents.

absolute terms) in the contribution margins (for post-pay high), albeit they are less marked than those suggested in our November 2010 consultation.[238]

A3.216 EE and O2 submit that we should express any difference relative to the size or value of each consumer segment. We see merit in expressing the estimated contribution margins in proportion to the average value of consumers for each of the segments considered. However, we have reservations over the methods suggested by some stakeholders. For example, in principle, we should relate the estimated yearly average margin contribution to the yearly average margin that MCPs derive from the average consumer in each segment. However, we do not have this information and this would require us or the MCPs to assume cost allocations across segments – assumptions which are likely to be largely arbitrary. On the other hand, expressing the relative importance in terms of average revenues could be misleading because we would be comparing a margin contribution to overall revenues. This would not be a like-for-like comparison and any inference may be misleading.

A3.217 Overall, therefore, based on the estimated differences in contribution margins between MCPs with different shares of subscribers, we consider that these differences remain today. Nonetheless, the materiality of this effect would be substantially reduced with the current estimates for LRIC+ in 2014/15. As the difference between the levels of the estimates under the two costs standards declines, the materiality of the impact declines accordingly. Any remaining material concerns seem more likely to be confined to the competition for post-pay consumers.

A3.218 To the extent that any residual competition concerns remained, then we consider that pure LRIC would be better than LRIC+ in terms of competition impacts.

Additional empirical evidence concerning competition among MCPs

A3.219 We have also looked at further evidence from stakeholders on competition among MCPs. As stated in paragraphs A3.190 to A3.195, we are cautious about the value of inferences concerning market conditions flowing from the performance of a specific MCP because each company's results are influenced by many factors. That said, in response to our November 2010 consultation,[239] H3G has submitted evidence on its experience in attempting to compete in certain consumer' segments. We find this evidence persuasive and it appears consistent with some aspects of the competition concerns discussed above.

A3.220 H3G explained to us in its submission that, historically, its early attempt to compete lead to an initial rapid gain in subscribers' share (in the first two years since entry it gained a 5% share of subscriptions). This, however, led to it facing a significant

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[238] Vodafone is also critical of the fact that we did not attempt to model scenarios to account for M2F volumes (page 17 of Vodafone's response to the November 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/mct-large-small/responses/vodafone.pdf). However, intuitively we do not believe that the addition of M2F volumes to our model should alter the difference in contribution margins for different subscriber shares. This is because consumers in a particular market segment are just as likely to make voice calls to fixed consumers irrespective of the market size of their MCP. The average contribution margin per consumer in each consumer segment will increase (across all MCPs) as a result of the inclusion of mobile to fixed traffic flows. But, crucially, the difference in the *relative* contribution margin in each customer segment for MCPs with different shares of subscribers would not change.

[239] Annex 3 of H3G's response to the November 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/mct-large-small/responses/h3g.pdf.

traffic imbalance and high net out-payments to other MCPs (at least partially compensated by its higher MTRs for inbound calls), so it had difficulty in continuing in its attempts to compete aggressively for those consumers. In other words, high MTRs meant that H3G found it difficult to offer competitive retail tariffs without generating a net outflow of calls (and the corresponding net outpayments) particularly as the asymmetry in MTRs between H3G and the other MCPs decreased over time.

A3.221 H3G has also provided more recent evidence on the impact of its recent experiences in introducing a new contract plan with very attractive tariffs for making outbound calls in the post-pay sector. This evidence seems consistent with concerns that MCPs with fewer subscribers face a disadvantage due to the impacts on the contribution margin of an increase in outbound calls.

A3.222 In its submission ✂

A3.223 ✂[240]

A3.224 ✂

A3.225 In addition to the above evidence, in its response to our April 2010 consultation, H3G submits that it had achieved far higher growth in the mobile data segment (e.g. the market for dongles), where it did not face the same barriers to expansion as for voice services. As with voice markets, other factors are clearly important in terms of outcomes in the data market segment. In particular, we note in paragraph A3.205 that consumer acquisition is easier in a growing market than in a mature market. But H3G believes that its success in growing share in this market is, at least, in part attributable to it not facing the same barriers to its pricing strategies that are seen in voice markets (i.e. due to high MTRs).

A3.226 In its response to our April 2010 consultation, H3G also recognises that in the short-run it may lose (in a static sense) from lower MTRs (i.e. by a shift to pure LRIC),[241] but it predicts that it will gain in the long run from the ability to compete more effectively across all consumer segments.

A3.227 In addition to the evidence submitted by H3G, we note that in another regulatory context, Vodafone – as a relatively new entrant in the Qatar mobile market - requested zero or very low MTRs for an interim period.[242]

Conclusions on the economic analysis of competition impacts among MCPs

A3.228 There are many factors that affect competition among MCPs, including the availability of spectrum, incumbency advantages, and advertising sunk costs that create brand value. Relatively high symmetric MTRs, such as those that arise under LRIC+, are also one of the factors affecting competition among MCPs. We have focused on this factor in isolation because it is central to this element (competition) in our consideration of the cost standard for the charge control remedy.

A3.229 Higher MTRs under LRIC+ (i.e. in 2010/11) appear to dampen competition among MCPs to some degree. These competition effects are a combination of:

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[241] Pages 379 to 380 of H3G's response to the April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/H3G.pdf.

[242] http://www.ict.gov.qa/files/images/Determination_on_Interconnection_Charges_bw_Voda_and_QTel_10_Feb_2009_(Non_Confidential_Version).pdf.

3.229.1 the presence of on- and off-net retail price differentials (which seems to remain at least in part because MTRs are above the marginal or incremental cost of termination);

3.229.2 the market-wide effects of high MTRs resulting in a retail price floor for voice calls that is higher than it would be under pure LRIC. This has a market-wide competition-dampening effect;

3.229.3 the impact that high MTRs may have on the incentives of MCPs with different shares of subscribers to compete for particular consumer segments, particularly for the post-pay high-end as these consumers usually have high outbound/inbound calling ratios and hence lead to large net out-payments for a MCP with fewer subscribers.

A3.230 A move to set MTRs to LRIC+ (that is, 1.61ppm) would reduce the materiality of, but not eliminate, these effects. They would be eliminated (or very substantially reduced) if MTRs were set to pure LRIC. If LRIC+ rates were higher as argued by some stakeholders, this competition effect would become correspondingly more significant.

Competition between MCPs and FCPs

April 2010 consultation

A3.231 In our April 2010 consultation[243] we noted that:

3.231.1 a switch to pure LRIC would ease potential concerns about competition between MCPs and FCPs stemming from SMP in call termination;

3.231.2 such concerns may be somewhat limited at present because we believed that, at the retail level, the two services are not close enough substitutes to be in the same product market;[244]

3.231.3 there was likely to be increasing convergence of fixed and mobile markets in the future; and

3.231.4 a shift to pure LRIC – either initially restricted to MTRs or subsequently applied to both MTRs and FTRs[245] - was likely to substantially reduce the absolute difference between FTRs and MTRs and, hence, would help reduce most competition concerns.

A3.232 We also noted some differences between the provision of services in fixed and mobile retail markets that might have some bearing on the cost standard adopted. For example, coverage costs do not exist as such in fixed networks and the subscriber driven network costs (also known as access network costs) are recovered via per line charges (whether wholesale line rental, LLU or monthly retail

[243] Paragraphs A12.92 to A12.98 at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/annexes/wmvct_annexes.pdf.

[244] We noted for example that in the 2009 Fixed Retail Narrowband Market Review, we concluded that, both in terms of access (i.e. subscription) and usage (i.e. calls), fixed and mobile services are in separate relevant retail markets. Nonetheless, we found the competitive interaction between fixed and mobile calls to be quite strong (and becoming more significant over time) for some call types (e.g., calls to mobiles).

[245] This is based on the expectation that applying pure LRIC would have a more marked impact on MTRs than on FTRs.

line rental fees). FTRs currently recover just the traffic sensitive costs of termination plus a contribution to common costs, but excluding any contribution to the access increment of the network. In mobile networks, coverage is a significant cost-driver and the cost of the coverage network is one of the categories of cost contributed to under LRIC+ MTRs to date. Therefore, this might drive a greater proportion of cost to traffic-related charges in mobile when using a supply-side (e.g. routing factor) approach to cost allocation. We noted that this argument may be less clear-cut if examined from a demand-side perspective. Common costs in both types of networks may still be more efficiently recovered via a fixed fee rather than a traffic-related fee. We thought that this left open the question of which side of the market fixed and common costs should be recovered from. We thought that it may be more efficient (and practical) to do so from the retail level where price discrimination is easier to implement.

Stakeholders' responses

A3.233 C&W, BT and H3G submit that a move to pure LRIC would reduce the difference between the F2M and M2M call prices. This would allow consumers to make efficient choices in choosing how to call a mobile number. Plusnet, Talk Talk, Gamma, FCS, Post Office, SSE, UKCTA all submit that high MTRs introduce distortions in competition between MCPs and FCPs.

A3.234 BT made[246] a number of submissions on the distortion to competition for mobile relative to fixed services arising from high MTRs:

3.234.1 Even though mobile and fixed are considered to be in separate economic markets (for market definition purposes), BT considered that there is a strong competitive interaction between the two. It noted, for example, that the choice of making calls from fixed or mobile is available to almost everyone in the UK. More generally, people make choices as to whether to give a fixed or a mobile number to the people who want to call them. BT also cited its own market research showing that 56% of mobile calls are made while the callers are in their homes or offices and, hence, within easy reach of a fixed phone. This suggests that users typically have a choice on whether to call from a fixed or a mobile phone.

3.234.2 BT suggested that FCPs' consumers contribute more to MCPs' common costs than the MCPs' own consumers and that this results in a material competitive advantage for MCPs. BT calculated that based on an indicative pure LRIC value of 1 ppm and MTRs at 6 ppm in 2008/09, fixed consumers contributed 5ppm to the termination costs of MCPs. With FTRs at 0.3 ppm in 2008/09, it estimated that contributions to common costs in one direction (fixed to mobile) are at least seventeen times those in the other direction. Even in the first year of the new control the transfer under LRIC+ would be significant (BT estimated this at £250 million per annum in 2011/12 based on total F2M call minutes of 12.5 billion per annum).

A3.235 BT also submitted that large on- and off-net call charge differentials are particularly distortive in a converging world where MCPs also provide fixed telephony services. In particular, MCPs can provide services to their large corporate consumers at rates that FCPs cannot match due to high MTRs. The high MTR for calls to MCPs make it difficult to offer "all you can eat" tariffs with bundles inclusive of fixed and mobile

[246] Pages 9 to 12 of BT's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/BT.pdf.

calls. BT noted that in part this was because such packages would have to carry a high price tag and in part because there is a risk of making a loss if users exceed their forecast usage. Adopting pure LRIC would mean there is fair competition in the retail market with no supplier/s using economic rents earned on voice termination to distort the retail market for access and outgoing calls.

A3.236 Plusnet (part of the BT group) noted[247] the importance for FCPs to be able to provide packages with cheap call prices, including inclusive bundles of F2M minutes. Moreover, it argued that high MTRs create an artificial price floor for the cost of calls to mobiles, preventing it from offering new and creative tariff plans. Once the rates are reduced, it suggested that it would pass on the benefits to its consumers in the form of flat rate calling plans and overall lower calling prices. C&W also argued[248] that high MTRs make it difficult for FCPs to include calls to mobiles in inclusive packages as MCPs can, which encourages consumers to use mobiles rather than fixed even if it is not the most efficient choice. It argued that lower MTRs should result in retail prices that help consumers make the most cost efficient choices when making calls to mobiles.

A3.237 H3G submitted[249] that high MTRs place a lower bound on F2M call prices. It considered that FTRs are already much closer to the cost of provision than MTRs and that this creates a perverse outcome whereby the charges for F2M calls are often higher than for a M2M call. Pure LRIC would remove this distortion and allow greater convergence.

A3.238 Other MCPs disagreed. In the annex to its submission, Vodafone argued[250] that Ofcom had not presented any evidence to support the view that there was increasing convergence between fixed and mobile services.

A3.239 As discussed in Section 7, paragraphs 7.182 to 7.198, a number of the main MCPs argued that in response to lower MTRs over time the price of F2M calls has not fallen. They argued that FCPs have been earning high margins on F2M calls. EE argued[251] that in the presence of any competitive distortions between MCPs and FCPs, it was more likely that reductions in MTRs would harm MCPs. This is because lower MTRs would allow FCPs to cross-subsidise their retail activities. EE further argued that FTRs are already set on a more generous (FAC basis)[252] and this will continue to apply for at least two years under our approach to regulating BT's FTRs. EE suggested[253], therefore, that the distortion to competition works in the other direction (i.e. MCPs would be disadvantaged relative to FCPs). As FCPs

[247] Plusnet's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Plusnet_NON-CONFIDENTIAL.pdf.
[248] Pages 1 to 2 of C&W's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Cable_Wireless_Worldwide.pdf.
[249] Paragraphs 95-101 of H3G's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/H3G.pdf .
[250] Paragraph 2.13 at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Vodafone_annexes.pdf.
[251] Paragraph 123 of EE's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Everything_Everywhere.pdf.
[252] The cost method used for BT's network charge control is broadly equivalent to LRIC+ (i.e. there is a mark-up for common costs over pure LRIC) although it is computed on a fully allocated cost (FAC) basis.
[253] Paragraph 123 of EE's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Everything_Everywhere.pdf

have been earning excessive (and increasing) margins on F2M calls, EE argued that not only would this directly harm consumers but it would also enable FCPs to cross-subsidise other services for which they will increasingly compete with MCPs in the future.

A3.240 EE considered that a larger mark-up for MTRs was justified by technology differences. It argued that mobile technology is inherently more costly than fixed technology. A key factor is the benefit of mobile coverage in enabling a mobile consumer to be contacted anywhere in the coverage area. Fixed consumers only contribute to the cost of a MCP to the extent that they call mobile consumers and hence use the mobile network. Under pure LRIC, F2M callers would effectively be given the benefit of mobile coverage without making any contribution to its fixed and common costs. Ofcom would be distorting demand in favour of F2M compared with M2M calls which would have to recover an even greater proportion of coverage costs from their retail tariffs.

A3.241 BT disagreed with this view[254] and argued that the asymmetrical treatment in termination rates between MCPs and FCPs distorts competition (in MCPs' favour). Setting MTRs at LRIC+ would mean that MCPs will recover mobile access costs[255] from termination whereas FCPs would be only allowed to recover the incremental cost of completing calls from termination (with access charges recovered via line rental charges). BT suggested that we should exclude mobile access costs even if some common costs were still recovered from termination under LRIC+.

Ofcom's analysis

A3.242 We note that Vodafone suggested that it would be difficult to reconcile our finding of separate retail fixed and mobile markets with concerns over competitive distortions between these separate economic markets. We do not agree with this view, as market definition is an exercise to frame an assessment of market power and identify circumstances where ex-ante regulation may be necessary. A finding of services being in separate markets does not preclude some material degree of competitive interaction between the markets. It only means that the degree of constraint exercised by mobile access and calls at the time of the 2009 retail narrowband market review was insufficient to include those services in the same economic markets as fixed access and calls.

A3.243 Vodafone submitted[256] that we have not provided any evidence of convergence in mobile and fixed services. Convergence is a term which is difficult to define exactly and can have a number of dimensions. There is some evidence of technological convergence; for example, MCPs are increasingly employing fixed technologies to terminate mobile calls (e.g. femtocells and UMA, which terminate the call over domestic broadband WiFi connections when in range).There is evidence of increasing convergence in terms of business models, as operators such as C&W

[254] Page 12 of BT's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/BT.pdf.

[255] BT notes that at Annex 12 of our April 2010 consultation (http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/annexes/wmvct_annexes.pdf), we refer to mobile access costs. BT sets out that, unlike fixed access, mobile access costs are largely not subscriber driven. However, it notes that the mobile access costs are incremental (direct) costs across the set of all mobile customers.

[256] Paragraph 2.13 at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Vodafone_annexes.pdf

have entered the market with its "Fixed Mobile Convergence" service that competes directly for fixed voice consumers using mobile voice technology.[257]

A3.244 In its response BT pointed[258] to a number of factors that, it submitted, suggest that the relative prices of calls from fixed and mobiles have some bearing on consumers' choice of service – and fixed and mobile services are available to almost all UK consumers. In many cases, a consumer making a mobile call is in a place within easy reach of a fixed line. In these cases the two types of call may be direct substitutes. More general trends in the decline of fixed geographic calls and the increase in mobile calls and mobile-only households suggest that consumers are also making choices between the two technologies.

A3.245 In our September 2009 statement in the Fixed Retail Narrowband Market Review we recognised increasing competition for fixed and mobile calls, such that for many consumers the two services could be substitutes. However, we remained of the view that the relevant economic market was for fixed calls and that the market definition should not be extended to include mobile calls:

> "*With 79% of UK consumers having both mobile and fixed line access most consumers clearly have a degree of choice as to whether to make a call on their fixed line or mobile. Although there will be circumstances where consumers can either only use a mobile or landline or where they have a strong preference for using one over the other, in general mobile and fixed calls are substitutable for each other." (paragraph 4.46)*[259]

However, we noted that:

> "*it is also clear from the evidence that the degree of substitution between mobile and fixed calls varies considerably depending on the nature of the mobile contract and the nature of the calls made." (paragraph 4.51)*[260]

Given some uncertainty and variation between consumers, we concluded that:

> "*…we consider that it is appropriate to take a conservative view of the market boundaries. As discussed in the introduction, the purpose of market definitions is mainly to support analysis of market power. The exclusion of mobile calls from the market sets a higher hurdle, in any analysis, in establishing that that market is effectively competitive. This strengthens the robustness of our finding of no SMP for the UK (excluding Hull)." (paragraph 4.52).*[261]

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[257] http://www.cw.com/fmc#overview-18

[258] Pages 9 to 10 of BT's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/BT.pdf.

[259] Fixed Narrowband Retail Services Markets: Identification of markets and determination of market power - 15 September 2009 http://stakeholders.ofcom.org.uk/binaries/consultations/retail_markets/statement/statement.pdf

[260] Fixed Narrowband Retail Services Markets: Identification of markets and determination of market power - 15 September 2009 http://stakeholders.ofcom.org.uk/binaries/consultations/retail_markets/statement/statement.pdf

[261] Fixed Narrowband Retail Services Markets: Identification of markets and determination of market power - 15 September 2009 http://stakeholders.ofcom.org.uk/binaries/consultations/retail_markets/statement/statement.pdf

A3.246 As BT pointed out in its response, and as discussed in Section 8, the 2009 EC Recommendation discussed the potential for competitive distortions between MCPs and FCPs.

A3.247 Given the concern that differences in the regulatory treatment of mobile and fixed termination could lead to some distortion to competition, we have considered the possible asymmetries in the mark-ups in MTRs and FTRs below.

Asymmetric mark-ups in MTRs and FTRs

A3.248 BT submitted that allowing MCPs to recover some of the mobile access costs from fixed callers creates a distortion as all fixed access costs are instead recovered through retail charges. By contrast, some MCPs submit that fixed callers benefit from being able to call mobile consumers wherever they are and, therefore, should contribute towards the cost of the mobile access network. This issue might be less material if the overall mark-ups implied by MTRs and FTRs were quite small. This is currently not the case as there are currently substantial differences in the level of mark-up for the two termination rates.

A3.249 BT calculated[262] that a fixed consumer is contributing approximately 5ppm in 2008/09 towards common costs of the terminating mobile network compared to a contribution by mobile consumers to the costs of the fixed network via FTRs of 0.3ppm. BT argued that the mark-up for common costs applied to MTRs was seventeen times that of FTRs.[263] In section 10, we estimate that the payments from FCPs to MCPs for MTRs will be around £0.6bn in 2010/11.

A3.250 Setting MTRs to pure LRIC would remove any mark-up on MTRs whereas a small mark-up would be maintained on FTRs (at least for the remaining two years of BT's charge control – ending 30 September 2013). In absolute terms the potential impact of the mark-up on FTRs seems potentially less significant than that for MTRs, since MTRs are currently many times higher than FTRs. Therefore, the adoption of pure LRIC for MTRs would substantially reduce the current absolute asymmetry of MTRs and FTRs. Hence any competitive distortions between mobile and fixed that arise from asymmetries in mark-ups would be reduced.

A3.251 In any case the same method (i.e. pure LRIC) may in future also be applied to FTRs, although this is a matter that will need to be considered in the next wholesale narrowband market review.

A3.252 Under our charge control glide path, MTRs will not be aligned with pure LRIC until 1 April 2014 – i.e. after the expiry of the charge controls on FTRs. As noted above, the form of regulation for FTRs from October 2013 onwards is a matter for the next wholesale fixed narrowband market review.

A3.253 MTRs under pure LRIC are designed to recover the cost of providing incremental traffic (including the associated usage of the radio access network). Therefore, while callers from fixed networks make no contribution to the coverage costs of a mobile network under pure LRIC MTRs, they do make a contribution to the radio access network costs driven by the incremental (terminating) traffic.

[262] Page 11 of BT's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/BT.pdf.
[263] BT calculates this multiple assuming no incremental costs to fixed termination. In BT's calculation, it assumes that all of the FTR of 0.3ppm contributes to the recovery of common costs. It notes however that given there are incremental costs associated with fixed call termination, the contribution to common costs will be lower than 0.3ppm and BT notes that the disparity would be even greater.

A3.254 This argument may be less clear-cut if examined from a demand-side perspective. Common costs in both types of networks may still be more efficiently recovered via a fixed fee rather than a traffic-related fee. This still leaves open the question on which side of the market fixed and common costs should be recovered from. As discussed in relation to economic efficiency above, it may be more efficient (and practical, absent the ability to do so on the termination side) to do so from the retail level where price discrimination is easier to implement.

Conclusions on the impact of choosing pure LRIC on competition between MCPs and FCPs

A3.255 In terms of competition between FCPs and MCPs, we conclude that there is some competitive interaction between FCPs and MCPs, despite our conclusion that the services are not in the same economic market. Adoption of pure LRIC would reduce the competitive impact of the difference between MTRs and FTRs.

MVNOs

A3.256 EE's[264] and Virgin Media's[265] responses to our April 2010 consultation noted the importance of MVNOs and argued that adoption of pure LRIC may undermine competition from MVNOs.[266]

A3.257 We noted in section 3, paragraph 3.140 that the term 'MVNO' is used differently in different Member States throughout the EU. In the responses from EE and Virgin Media they have interpreted MNVO to be an operator that relies on national roaming agreements with other mobile network operators to provide radio access networks services. We use the term to describe an MCP that does not operate a mobile communications network, usually restricted to retail and distribution activities and not normally operating switching and/or call routing equipment.[267] As such, the markets we define in this statement do not include the termination of calls by MCPs that we consider to be MVNOs (such as Virgin Mobile). In this market review, we have distinguished between:

3.257.1 MVNOs which may have national roaming agreements, but which do not themselves operate mobile network infrastructure; they consequently fall outside our market definition and we have not designated them as having SMP; and

3.257.2 MCPs that operate mobile number ranges and mobile network infrastructure (such as switches) but rely to some extent on national roaming agreements due to a lack of local or national radio access networks; they fall within our wholesale market definition (i.e. we have designated them as having SMP) and for the purposes of this market

[264] See page 17 of Everything Everywhere's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Everything_Everywhere.pdf
[265] See page 6 of Virgin media's response to our April 2010 consultation at at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Virgin.pdf
[266] Virgin Media argued that MVNOs are an important contributor to competition in the UK. Virgin Media noted that one of the reasons MCPs strike deals with MVNOs is due to their ability to attract additional traffic to their networks. It argued that as MTRs decrease and congestion increases, however, MCPs may have less of an incentive to enter into new agreements with MVNOs and in fact would have an incentive to rationalise the number of MVNOs with consequences for consumer choice and competition.
[267] See footnote 77 in our April consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/summary/wmvct_consultation.pdf

review we do not classify them as MVNOs. The fact that these MCPs rely on roaming agreements with other mobile network operators does not suggest that they should be viewed any differently to other designated MCPs in our assessment of competitive effects.

A3.258 The operators in the first group are mostly 'resellers' who do not own and operate a mobile network (including any switching capability). By definition, they rely on a wholesale mobile network to host and receive calls from originating parties (including the interconnection switch). They do not set MTRs for calls to their subscribers rather their host network provider will set the MTR for these calls and receive termination payments from OCPs. The commercial relationship between the host MCP and the MVNO will be governed by the wholesale agreement between them. As a result, the impact of a decline in MTRs may or may not directly affect the MVNO's profitability. The wide variety of wholesale arrangements and the role of MTRs within these arrangements is evidenced by the breadth of stakeholder responses from MVNOs.[268]

3.258.1 Tesco Mobile for example *"welcomed Ofcom's proposals to reduce mobile termination rates and believe that a consistent approach should be applied across the industry (for fixed line and mobile operators)."*[269]

3.258.2 Adsa noted that they *"welcomed Ofcom's decision to set a timetable for the staged reduction of Mobile Termination Rates. We see this as an opportunity to further reduce the cost of calls to our customers. For MVNOs such as Asda Mobile, the presence of MCT interconnect fee creates an unavoidable cost which significantly increases the wholesale charge. For example, around 60% of the wholesale charge for a 1 minute call is made up of the interconnect charge from the MNO. "*[270]

A3.259 We also note that MTRs have been declining since the MVNO market emerged in the late 1990s and therefore it is likely that there is an established method within existing contracts for commercial adjustments due to MTR changes. If a MVNO has an existing contractual relationship with a host MCP that entitles them to a share of the termination revenue they, along with the host MCP may see a reduction in revenue as MTRs fall, though the ability to renegotiate commercial contractual terms may negate this effect for some MVNOs.

A3.260 Nonetheless we recognise that there is competition between MVNOs for retail customers and we expect that as the underlying economics of the industry change the viability of various business models will also change, which could also lead to changes to MVNOs' retail pricing structures as described in section 7 and potentially market entry and market exit of specific MVNOs.

A3.261 In short, although we expect in most cases MNVOs to be neutral to the level of MTRs as their contractual relationships with their host MCPs is likely to be adapted to reflect lower MTRs, there may be some differences in effect depending on the

[268] See responses from Tesco mobile (http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Tesco_Mobile.pdf), Asda (http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Asda.pdf) and Virgin Media (http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Virgin.pdf) as examples of MVNOs who have widely varying attitudes to lower MTRs.

[269] Paragraph 4 of Tesco mobile's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Tesco_Mobile.pdf

[270] Asda mobile's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Asda.pdf

commercial arrangements between MVNOs and their host MCP. However as noted above the fact that these operators rely on roaming agreements with other mobile network operators does not suggest that they should be viewed any differently to other MCPs in our assessment of competitive effects.

Other competition effects

A3.262 Some stakeholders identified additional competitive impacts. C&W argued[271] that a benefit of lower MTRs under pure LRIC is that it would remove some of the incentives for arbitrage such as the use of mobile number ranges for services that are not mobile.

A3.263 To the extent that pure LRIC reduces current arbitrage opportunities (that are in some sense distortive) then this could be an additional reason in favour of the adoption of pure LRIC, although LRIC+ may also reduce arbitrage opportunities. Without further assessment of this point,[272] we have not attached any material weight to this argument in our competition assessment.

Distributional effects assessment

A3.264 In section 7 we suggested that a shift to pure LRIC may have some impact on (both fixed and mobile) usage, and potentially lead to some reduction in mobile ownership. If those who give up their mobile in response to retail price changes which result from a shift to pure LRIC-based MTRs (but would subscribe if MTRs were set according to LRIC+) were likely to be vulnerable consumers, equity effects may become a consideration in the choice between LRIC+ and pure LRIC. Similar reasoning could apply to any impact on usage, both from mobiles and for F2M calls by fixed users.

A3.265 Below we set out what we said in our April 2010 consultation on the possible distributional effects of lower MTRs. We then put the distributional impacts in context by explaining how equity considerations come into setting MTRs, and which consumers we are concerned about from an equity perspective. We then consider what stakeholders told us in their responses in relation to the impact on vulnerable consumers, and provide our further analysis on this.

A3.266 In our April 2010 consultation, we suggested that our preferred definition of vulnerable consumers is that of households with an income of less than £11,500 a year, or in the DE socio-economic group. We noted that data in relation to these consumers, particularly income groups, is often imperfect, as respondents often report their income inaccurately, or refuse to give information on this at all. We therefore suggested that analysis in relation to these groups should be considered as illustrative only.

A3.267 Our data[273] suggested that mobile-only and fixed-only consumers were both more likely to belong to vulnerable groups compared to the total population and

[271] Page 2 of C&W's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Cable_Wireless_Worldwide.pdf.
[272] We have not undertaken a further assessment of this competition effect, as predictions about how operators might 'game' or arbitrage the regulatory arrangements under pure LRIC and LRIC+ in 2014/15 is very difficult. Further, we have not been presented with specific examples of current services that might generate any competition concerns at prevailing higher MTRs.
[273] From Ofcom's Technology Tracker survey.

compared to those who use both services. We also noted that mobile ownership among vulnerable groups lagged behind that of the population as a whole, but had recently been growing at a slightly faster rate.

A3.268 We examined whether those most likely to be negatively affected by a move to pure LRIC (for which we used pre-pay users as a proxy)[274] were more likely to be vulnerable. We found that mobile-only pre-pay users were more likely to be on low incomes than pre-pay users or mobile users in general, while for those in the DE socio-economic group the differences did not seem to be significant. However, we noted that this was based on a very small data sub-sample, and so may not be robust.

A3.269 As mentioned above, we noted that fixed-only consumers were also more likely to be in low income households and belong to the DE socio-economic groups than fixed users in general. We noted that a similar proportion of fixed-only and mobile-only users are on low incomes and in the DE socio-economic group, and so while some vulnerable consumers may be disadvantaged, others may gain. Because of this, we concluded that it was unclear whether vulnerable consumers as a group would be worse off, but that this seemed unlikely.

What is the significance of equity considerations in setting MTRs?

A3.270 EE,[275] O2,[276] Virgin Media[277] and Vodafone[278] all stress the negative effect low MTRs will have on vulnerable consumers, and argue that we should therefore not set MTRs according to pure LRIC. EE and O2 suggested that this would be contrary to our statutory duties. EE[279] highlighted our principal duty[280] and our specific obligation to have regard to the needs of persons with disabilities, the elderly and those on low incomes.[281] In EE's view, a move to pure LRIC would have a net detriment on consumers and, given our statutory duty to act in the interests of all consumers, we should not favour this option. O2[282] stated that a move to pure LRIC would adversely affect low income consumers, in breach of our duty to have regard to their interests.

A3.271 Our aim in designing a charge control is to set a termination rate which is consistent with correcting the distortion created by SMP in the market for mobile call termination, which is excessive MTRs leading to consumer harm. In doing so, we are also required to act in accordance with our primary duty and, as EE and O2 have noted, to have regard (in so far as we consider them to be relevant) to the needs of the disabled, the elderly and those on low incomes. We are confident that our final decision (including our choice of cost standard) is consistent with these specific duties, as well as the other legal tests and our other statutory duties. We consider this in detail in Section 10 (at paragraphs 10.137 to 10.150).

[274] It should be noted that we considered (and still consider) pre-pay to be a poor proxy for identifying marginal consumers, as we discuss in paragraph A3.282.
[275] For example, see paragraphs 68-78 of EE's response to the April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Everything_Everywhere.pdf.
[276] For example, see O2's response to consultation question 9.9 on page 66 of its response.
[277] Page 13 of Virgin Media's response.
[278] Pages 3-4 of Vodafone's response.
[279] Paragraphs 208-210 of EE's response.
[280] To further the interests of citizens in relation to communications matters, and to further the interests of consumers in relevant markets, where appropriate by promoting competition (section 3(1) of the Act).
[281] Section 3(4)(i) of the Act.
[282] Paragraph 146 of O2's response.

A3.272 We are therefore concerned that our decision to regulate MTRs promotes efficiency and sustainable competition and confers the greatest possible benefits on consumers overall, and that we have had due regard to vulnerable groups. This is not the same, in our view, as setting MTRs with the principal aim of engineering social inclusion in the market. This might have been a by-product of how MTRs were set in the past, but it should not be the principal objective.

A3.273 MTRs are, in fact, a highly inefficient tool for pursuing such social outcomes. As the CC noted in 2009, high MTR revenues are not directed specifically towards attracting or maintaining marginal consumers, even when this was one of the reasons why regulated MTRs were in the past set above cost (i.e. when there was a network externality surcharge (NES) factored into MTR levels). Instead, the CC concluded that these revenues were distributed into lower prices for all consumers, including those who did not need such subsidies in order to subscribe. This was part of the reason that the CC determined that a NES should not be included in the calculation of MTRs in the previous charge control, as the CC judged that the detriments arising from such a high level of 'leakage' were likely to be significant in comparison with the benefits of the NES.[283]

A3.274 We have acknowledged in our April 2010 consultation that the level of MTRs may affect ownership, and that any concerns this may create with regard to equity and the effect on vulnerable consumer would be better dealt with through other means, giving the example of a social tariff. This was not (and is not) intended to be viewed as a definitive statement of intent to embark on such a policy, but an illustration of the fact that Ofcom has other channels through which it is appropriate to tackle social inclusion objectives (and Government may have further options). We disagree with Virgin Media[284] and EE[285] that this would amount to addressing a problem caused by inappropriate regulation with further regulation – rather, we consider that, in principle, targeting social inclusion through MTRs would amount to addressing a social welfare agenda through incorrectly regulating SMP. In practical terms, we also need to take into account the CC's view that high MTRs are likely to be an ineffective tool to achieve such ends.

A3.275 Having said this, if we considered the potential equity concerns to be material, or we thought that pure LRIC resulted in net consumer detriment then this would affect our decision between LRIC+ and pure LRIC. We consider below whether a move to pure LRIC would result in an equity cost, and also whether there are any possible gains which may accrue to vulnerable fixed consumers which we should also take into account.[286]

Which consumers are most vulnerable?

A3.276 It is worth clarifying which consumers we believe should be considered in the distributional impacts analysis, given the differences in the definitions and terms

[283] See paragraphs 4.96-4.151 of the Mobile phone wholesale voice termination charges Determination, available at http://www.competition-commission.org.uk/appeals/communications_act/mobile_phones_determination.pdf.
[284] Page 14 of Virgin Media's response.
[285] Paragraph 82 of EE's response.
[286] In pages 41-42 of its response, Vodafone argues that it is not tenable for us to divorce our proposals from the future options for universal service provision, given the importance of mobile in meeting existing user needs for communications services and the likely impact of the MTR proposals on the level of take-up. However, as we set out in Section 7 and in paragraphs A3.297 to A3.302 below, we do not consider that our proposals are likely to have a substantial effect on mobile ownership.

used in this review and previous reviews, and those used (implicitly and explicitly) by stakeholders.

A3.277 As noted above, in our April 2010 consultation, we defined vulnerable consumers as those who are on incomes of less than £11,500 or those in the DE socio-economic group. It is worth clarifying that we are more concerned about those who have only one subscription (e.g. only own one SIM or phone), as the loss of this subscription would mean the loss of ownership completely. We have no data on the propensity for low income consumers and those in the DE socio-economic group to hold multiple subscriptions, but consider that this is likely to be a small minority of these consumers.

A3.278 We are also more concerned about those who are mobile-only. This is partly because mobile-only consumers would receive no countervailing benefit on the fixed side, and also because for these consumers, their mobile is their only access to telecoms services, and so the loss of this would be more significant to their welfare than if they also had a fixed line. Conversely, when considering possible equity improvements, we believe we should mainly focus on the effect on fixed-only consumers. We compare any negative impact on mobile-only consumers against any positive benefits to fixed-only consumers. Ofcom data[287] shows that 25% of adults in the DE socio-economic group live in mobile-only homes, while 12% live in fixed-only homes. Among adults in households with a yearly income of less than £11.5k, 28% live in mobile-only homes and 13% in fixed-only homes. While this shows that a substantial proportion[288] of vulnerable consumers are either mobile-only or fixed-only consumers, it is also the case that the majority of vulnerable consumers use both fixed and mobile telephony (or use neither). Users of both fixed and mobile services are of less concern in our equity analysis because the harm and benefits will be off-set (and in some cases may largely cancel out) for those consumers. Therefore, our analysis focuses on vulnerable consumers reliant on just one form of telephony (i.e. just on mobile or just on fixed)

A3.279 Another term used both in previous reviews and by stakeholders is "marginal consumer". However, in many cases the same term is used to describe different concepts:

3.279.1 The economic concept, where the marginal consumer is a tightly defined term, meaning the subscriber(s) at the margin of the market – e.g. for whom a small change in price would make the difference between them subscribing and not subscribing.

3.279.2 From the perspective of MCPs, it may also refer to those which are marginally profitable – i.e. those for whom the termination profit at given MTRs is the difference between them being profitable to serve or not. As mentioned in Section 7 (paragraphs 7.84 to 7.86), we believe that the view that a single subscriber may be considered profitable or unprofitable on the basis of their origination and termination revenues is inappropriate for our assessment.

3.279.3 In previous market reviews going back to Oftel's 2001 MCT statement, marginal subscribers were defined as those not willing to subscribe at the retail marginal cost (MC) of subscription, but for whom the marginal social benefit (MSB) of them joining exceeded MC – in other words for whom the

[287] Data comes from Ofcom Technology Tracker survey, Q1 2010.
[288] And, in the case of mobile-only, a growing proportion.

marginal external benefit (MEB) exceeded the subsidy required to induce them to join. However, this reflects economic efficiency rather than equity considerations.

A3.280 It is likely that there are a number of consumers on low incomes/in the DE socio-economic group who would not be at risk of giving up their mobile if prices were to increase by a modest amount i.e. who are not truly marginal consumers (in the economic sense referred to in the first sub-paragraph above). The likely retail price increases resulting from moving from LRIC+ to pure LRIC are relatively modest (see Section 7). It should be noted that we place more emphasis on the potential for a reduction in ownership among low income consumers and those in the DE socio-economic group than on the possibility that such consumers may be forced to pay higher prices. While having to pay higher prices would also present a concern from an equity perspective, the greater concern has to be those who would give up their ownership of mobile as a result of our proposals, as this will have a greater effect on welfare. Furthermore, as argued in Section 7 we believe that price increases from the waterbed effect to vulnerable consumers are relatively unlikely or, if they occur, will be modest.[289]

A3.281 "Low usage" subscribers are also used as a proxy for vulnerable consumers. However, we consider that this is likely to be a poor proxy, as the link between usage and income is unclear. Further, to the extent those we are concerned about are mobile-only consumers, this implies that any calls these subscribers make must be from their mobile, and so it is not clear how far these consumers' usage will be less than that of average consumers.

A3.282 Finally, prepay is on some occasions used as a proxy for vulnerable consumers, as the majority of these consumers tend to have prepay subscriptions. While those on low incomes/in the DE socio-economic group are more likely than the average mobile user to use pre-pay,[290] the majority of subscriptions in the market as a whole (58%) are pre-pay subscriptions. As such, pre-pay is clearly a poor proxy, as many of these pre-pay consumers would not be considered vulnerable.

A3.283 Therefore, the concept of 'marginal consumers' is closely linked to the question one needs to answer. In this case it is to assess whether any impact in terms of ownership and usage is more likely to fall on categories of consumers we define as vulnerable.

A3.284 Therefore, we are most concerned about the potential impact that a switch to pure LRIC may have on those consumers who cumulatively display the following characteristics:

- Those who have incomes less than £11,500 per annum or are in the DE socio-economic group;
- Those subscribers which have only one mobile subscription or service; and
- Those subscribers which have no fixed line telephony (for a negative equity impact) or conversely, those who have access only to a fixed line (for a positive equity impact).

[289] See section 7 paragraph 7.135.
[290] See figure 20 of the Consumer Experience Report 2010, available at http://www.ofcom.org.uk/static/tce-10/fig-20.html.

Effect on vulnerable mobile consumers

A3.285 Below we summarise the views of respondents on the likely effect that reducing MTRs in line with pure LRIC will have on vulnerable mobile consumers. We then present our assessment of these views and the further analysis we have undertaken, firstly in relation to the effect on prices and ownership, then the effect on usage by low income consumers and those in the DE socio-economic group.

A3.286 As we set out in section 7 at paragraph 7.19, the relevant factual and counterfactual are MTRs set under pure LRIC and under LRIC+. This amounts to a difference of around 0.9ppm. However, most submissions focus on a much higher MTR and so the difference is much larger in these comparisons. This must be factored into the analysis of the stakeholders' arguments. (As noted above if one accepted some of the stakeholders' arguments on the LRIC+ value, the effect would be both to put more weight on some of the distribution effects discussed here and also to increase the materiality and significance of the detrimental competitive impacts discussed previously in this annex.)

A3.287 As set out in paragraph A3.280 above, in our assessment of the effect on mobile consumers, we place greater weight on the potential for a reduction in ownership among low income consumers and those in the DE socio-economic group than on the potential for such consumers to be forced to pay higher prices, although we acknowledge that this latter effect might also be a concern from an equity perspective.

A3.288 Set against this is the potential for equity improvements. For example, if the result was that lower income mobile-only (and more generally lower income mobile) consumers and those in the DE socio-economic group could increase their usage, this would be a positive distributional effect.

Views of respondents to the consultation

A3.289 BT[291] highlighted that the Terminate the Rate campaign has struck a chord with those on fixed and limited incomes, such as students. This is borne out by the responses from Dementia UK, whose members' income is often "*barely enough to get by on*",[292] and IMA,[293] whose members work with those who need financial advice. Both of these respondents suggested lower MTRs will reduce costs for their members. However, O2,[294] Virgin Media[295] and EE[296] suggested that lower income prepay consumers will face higher charges. Consumer Focus[297] urged Ofcom to remain alert to MCPs introducing policies to recoup lost revenues that penalise

[291] Page 4 of BT's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/BT.pdf.
[292] See Dementia UK's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Dementia_UK.pdf
[293] See IMA's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Institute_of_Money_Advisers.pdf.
[294] For example, see paragraph 16 of O2's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/O2.pdf.
[295] Page 13 of Virgin Media's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Virgin.pdf.
[296] For example, see paragraphs 68-69 and 72-74 of EE's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Everything_Everywhere.pdf.
[297] Page 5 of Consumer Focus's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Consumer_Focus.pdf.

those on low incomes and make mobile services unaffordable for these consumers. It suggested that, although this has not happened to date, it is a possible reaction to further reductions in MTRs, particularly as they reach very low levels. It also highlighted the tendency for operators to follow similar behaviour when making disadvantageous changes.

A3.290 EE[298] highlighted the dominance of prepay among those on low incomes as demonstrating the preference of low income consumers for avoiding fixed fees. EE further suggested that, even if they wanted one, many potential subscribers could not demonstrate sufficient credit worthiness to get a contract. However, H3G[299] suggested that there is no reason to believe the vulnerable will be particularly affected. This is because it considered that fixed charges will increase least (if at all) for those who are most sensitive to them, and that there is no particular link between those who are least sensitive to call prices and the vulnerable. H3G argued that increased competition will prevent low income families being forced to pay more. H3G further suggested that evidence from emerging markets provide evidence that low income consumers can be served profitably.

Effect on prices and ownership among vulnerable mobile consumers

Our view of consultation responses and further analysis undertaken

A3.291 Throughout this analysis, it must be borne in mind that the difference in MTRs between the LRIC+ and the pure LRIC scenario is limited, particularly compared with the difference in current MTRs and even MTRs based on LRIC+ in 2014/15 i.e. the reduction in MTRs which occurs regardless of the cost standard chosen. It is therefore likely that the effect which will arise from setting MTRs based on pure LRIC rather than LRIC+ will be limited in its materiality. As estimated in Section 7 paragraph 7.135 the difference between LRIC+ and pure LRIC MTRs amounts to around £0.2bn less revenue for all MCPs in the final year of the charge control.[300] Assuming, for simplicity of illustration, a full waterbed and that this was recovered equally from all users, this would imply a price increase of around £2.50 per user or around £0.20 per user per month. Clearly, with a less-than-complete waterbed effect and the fact that MCPs may price discriminate, this price increase would be smaller.

A3.292 We first focus on the effect on consumers in terms of the level of prices they are likely to face. All respondents seem to suggest that vulnerable mobile consumers are likely to be sensitive to prices. As set out in our assessment in Section 7, this suggests that price increases to this group are likely to be minimal, as there is little for the MCP to gain if raising prices to these consumers forces them to give up their mobile, rather than increasing prices to those whose demand for subscription is less elastic (since we know of no reason why the cost of serving vulnerable consumers would be higher than that of serving any other consumer with a similar usage pattern, and so consider that very few are likely to be unprofitable to serve even with very low MTRs).

A3.293 An additional factor to consider is that, to the extent we are focusing on mobile-only consumers, these consumers are dependent on mobile as their only source of

[298] Paragraph 70 of EE's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Everything_Everywhere.pdf.
[299] Paragraphs 86-92 of H3G's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/H3G.pdf.
[300] Assuming no change in traffic between now and 2014/15.

access to telecommunications. Telecoms is a very valuable service which people are loath to give up, suggesting their demand (for subscription) will be price inelastic. Since vulnerable consumers rely on mobile for telecoms access, it may follow that their demand could be price inelastic as well, and so they would not give up their mobile easily. It is likely that consumers will make other changes to their expenditure habits to accommodate the increased expense of mobile before giving up their mobile altogether. However, this willingness to pay to keep a mobile must be balanced against the ability to pay for it, which is likely to be highly constrained among the vulnerable given their low income status.

A3.294 We now consider the effect on the structure of prices. We agree that those on low incomes and in the DE socio-economic group are likely to be sensitive to fixed charges. EE stated[301] that a significant proportion of those on low incomes could not demonstrate sufficient creditworthiness to access a contract tariff. In any event, low income and DE consumers are often unwilling to commit to repeated expenditure as this reduces control over budgeting, as highlighted by EE.[302] In addition, a greater proportion of low income and DE consumers are mobile-only compared to the population as a whole:[303] 15% of all adults live in mobile-only homes, compared to 28% of adults in the DE socio-economic group and 31% of adults in low income households. This all suggests that vulnerable consumers may be among those consumers who are highly sensitive to fixed fees. This suggests that operators are likely to seek a way to avoid levying subscription fees on such consumers. However, O2 argued[304] that, where consumers do not make outbound calls (as is probably the case for some vulnerable consumers), this may not be possible, as raising call prices would be ineffective as a measure to raise additional revenue.[305] While this suggests subscription fee increases (or reductions in handset subsidies) may be required, this must be balanced against the fact that forcing mobile subscribers to give up their subscription would also be an ineffective means of raising additional revenue and, as argued above, would not generate significant cost savings.

A3.295 O2[306] and EE[307] argued that, where consumers are sensitive to subscription fees (or do not pay subscription fees), MCPs will increase usage charges instead.[308] If this is the case, it is likely that those on low incomes will limit their usage of mobile so as to control their expenditure (indeed, EE argued that this is one of the benefits low income consumers derive from prepay subscriptions) and so increasing usage

[301] Paragraph 70 of EE's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Everything_Everywhere.pdf

[302] See section 4.3.2 of http://stakeholders.ofcom.org.uk/binaries/research/consumer-experience/annex4.pdf

[303] See figure 24 of the Consumer Experience Report 2010, available at http://www.ofcom.org.uk/static/tce-10/fig-24.html.

[304] Paragraph 180 of O2's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/O2.pdf.

[305] However, where other subscribers on the same network make calls to these consumers, the MCP could raise call prices for those subscribers and earn more revenue (depending on their elasticity of demand for making these calls).

[306] Paragraph 153 of O2's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/O2.pdf

[307] Paragraphs 48-49 of EE's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Everything_Everywhere.pdf

[308] Since MTRs are a cost of providing outbound voice services, operators' costs fall as MTRs decline. Therefore, rather than increasing prices per se, an operator could choose not reduce its call prices as MTRs decline. This would allow the operator to generate more profit without affecting consumers' usage.

charges is less likely to affect vulnerable consumers' decision whether to take a mobile service.

A3.296 It must be remembered that, where vulnerable consumers do face a price increase, this could also present an equity concern as these consumers are less able to afford such an increase. However, these increases are likely to be less significant in absolute terms for vulnerable consumers than for less price sensitive consumers. We expect that MCPs would not increase call charges to price sensitive consumers to the extent that this may cause them to give up their subscription. In addition, as argued above this loss is much less significant than that presented by the loss of mobile ownership for a vulnerable consumer.

Effect on ownership

A3.297 Vodafone's[309] research suggests that DE consumers are disproportionately more likely to give up their mobile. Of the 4.1m people they found would give up their mobile, 1.1m were from the DE socio-economic group. On 11 March 2011, we received a letter from Vodafone stating that it had overestimated the price increase which would be faced by low spending consumers. It stated that the reduction in ownership, estimated in its survey results, is therefore overstated. ✂

A3.298 In any event, as noted in Section 7 and Annex 5, we consider that Vodafone's consumer research suffers from a number of methodological concerns generating spurious accuracy in its ability to measure the likely effect of lower MTRs on vulnerable consumers. Of particular concern with respect to the findings in relation to vulnerable consumers was the use of an on-line survey to gather responses. As we noted in Annex 5, online surveys over-represent respondents with the internet at home and those that have a landline (this is of particular concern when considering low income groups, as these consumers are less likely to have a landline or internet access at home than other groups). There are likely to be fundamental differences between the attitudes of those who are online and those who are not. The profile of the DE/low income group surveyed suggests that the mobile dependence of the surveyed DE/low income customers may be minimal, due to landline usage for voice calls.[310]

A3.299 In addition, Vodafone's consumer research assumes all spending cohorts will face some price increase. As set out in Section 7 paragraphs 7.101 to 7.111, where consumers have a high demand elasticity for subscription (which is likely to be the case for vulnerable consumers, as set out above) price increases are unlikely to be material, if they are levied at all. This means we do not believe that the results of Vodafone's research are reliable.

[309] Page 38 of Vodafone's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Vodafone.pdf.

[310] We would note that, as set out in paragraph A3.278, the fact these consumers have both a landline and a mobile makes them less vulnerable.

Figure A3.7: Mobile ownership by low income and DE socio-economic groups[311]

Source: Ofcom; data from Q1 each year except 2005-2007 (inclusive) where it is for Q2

A3.300 Figure A3.7 shows the growth in mobile ownership among low income consumers and those in the DE socio-economic group. This shows that mobile ownership among these groups has grown substantially, from 52% of low income consumers and 59% of those in the DE socio-economic group in 2003 to 81% and 83% respectively in 2010. While this is still lower than take-up within the population as a whole, the gap has narrowed over the period shown during which MTRs have declined considerably (many factors will obviously affect mobile penetration over time in different consumer segments).

A3.301 We consider that the actual effect on consumers in terms of their decision whether to drop their mobile ownership will depend upon how much prices have to rise, what the total price is and what proportion of their income this represents. As noted above in our discussion in Section 7 and in our review of the evidence on the waterbed effect in the past (see for instance the evidence in the Genakos and Valletti papers),[312] we consider that any price increase for vulnerable consumers is likely to be relatively small, and so may not be significant enough to force many vulnerable consumers to drop their subscription.

[311] The proportion of respondents who are not willing to reveal their income fluctuates year on year. Therefore, trends amongst low income groups should be treated with caution, as year-on-year comparisons will not necessarily compare like with like.

[312] Genakos C, Valletti T, *Testing the 'waterbed' effect in mobile telecommunications*, Journal of the European Economic Association (forthcoming) available at http://www.sel.cam.ac.uk/Genakos/Genakos%20Valletti-Testing%20Waterbed%20Effect.pdf and Genakos C, Valletti T, *Seesaw in the Air: Interconnection Regulation and the Structure of Mobile Tariffs,* Information Economics and Policy (forthcoming) available athttp://papers.ssrn.com/sol3/papers.cfm?abstract_id=1687814

Conclusion on ownership

A3.302 It is possible that vulnerable consumers may face some price increase, although this is likely to be limited by their ability to pay higher charges and so any increase is likely to be small both in absolute terms and compared to those faced by the average consumer. Any price increase is more likely to come from changes to usage charges rather than subscription-based fees, given vulnerable consumers' apparent sensitivity to such fees. We consider that such price increases are unlikely to be material enough to cause many to drop their mobile subscriptions.

Effect on usage by vulnerable mobile consumers

Our view of consultation responses and further analysis undertaken

A3.303 As noted above, H3G[313] argued that there is no particular link between those who are least sensitive to call prices and vulnerable consumers. This could suggest that vulnerable consumers are no less likely to expand their usage as call prices fall than other users. However, as set out in paragraph A3.295 above, it is likely that low income consumers and those in the DE socio-economic group limit their usage in order to limit their expenditure. It therefore seems unlikely that they would disproportionately increase their mobile usage if call prices fall. However, as set out in Section 7, empirical evidence suggests that usage in general is relatively price inelastic, so this observation may not be limited to vulnerable consumers.

A3.304 In addition, as set out in paragraph A3.302 above, MCPs may choose to increase or maintain call prices at their current levels instead of raising subscription fees to those sensitive to fixed fees (as we argue vulnerable consumers are likely to be). If this is the case, there would be no impetus for increasing usage.

Conclusion on usage

A3.305 The analysis suggests that while usage may expand to some extent if usage prices fall, we cannot tell whether usage by vulnerable consumers would increase more or less than that of the general mobile population. In addition, we consider that vulnerable groups are more likely than others to see increases in call prices rather than fixed fees. It therefore seems unlikely that higher usage will represent a significant source of countervailing benefit for vulnerable mobile consumers.

Effect on vulnerable fixed consumers

A3.306 Gains made to fixed users who are on low incomes or in the DE socio-economic group would also be positive from an equity perspective, and so need to be weighed against the potential losses in the mobile market. These are assessed below.

[313] Paragraph 87 of H3G's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/H3G.pdf.

Views of respondents to the consultation

A3.307 Most respondents did not examine the effect on vulnerable fixed subscribers specifically, instead focusing on the likely effect on fixed consumers in general. This is discussed in Section 7.

A3.308 The Post Office highlighted that many of their consumers are socially or financially excluded, and will be direct beneficiaries of lower MTRs.[314] However, O2 suggested that there is no reason to believe vulnerable fixed consumers will benefit, as most will be on the BT Basic[315] tariff, which has secured regulatory approval to increase prices in line with inflation.[316] O2 also argued that we have overestimated the number of fixed-only consumers, given the downward trend in fixed-only ownership and the step change which the move away from the old USO tariffs to BT Basic is likely to have caused.[317] FleXtel argued that benefits to the fixed market will not help the most vulnerable, as a landline is not an option for the homeless.[318]

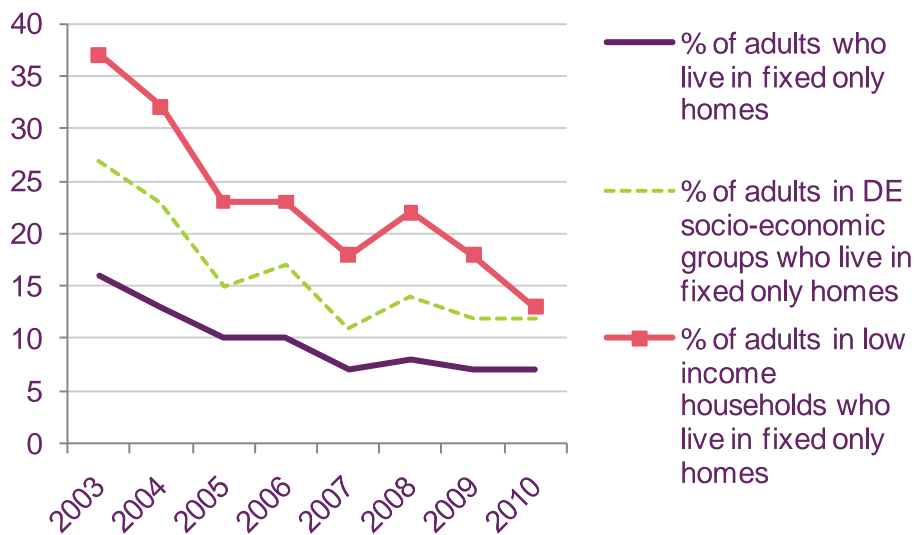
Our view of consultation responses and further analysis undertaken

A3.309 As set out in section 7, for the period during the charge control, depending on the assumptions made about pass-through and elasticity, setting MTRs based on pure LRIC rather than LRIC+ is estimated to result in roughly £90m less revenue being transferred from FCPs to MCPs on average each year in NPV terms, which will be passed on to fixed subscribers through lower prices for fixed services. This would amount to around £3 per fixed line[319] per year if the same benefit was passed through to all fixed consumers.[320,]

A3.310 As noted above and in the chart below, those on low incomes and in the DE socio-economic group are more likely than the general population to be fixed-only subscribers.[321]

[314] Page 2 of the Post Office's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/Post_Office_Limited.pdf.
[315] 'BT Basic' is the brand name used to describe BT's 'social tariff', offered solely to consumers who are eligible for means-tested benefits. The introduction of BT Basic superseded previous offers made under the universal service obligation (which remains, but focused on supply to all parts of the UK at an affordable rate, rather than reaching low-income consumers). More information on BT Basic can be found at http://www.bt.com/includingyou/other-products-services-bt-basic.html.
[316] Paragraphs 203-213 of O2's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/O2.pdf.
[317] Paragraphs 203-208 of O2's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/O2.pdf.
[318] Page 8 of FleXtel's response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/O2.pdf.
[319] Assuming the number of fixed lines remains constant at 32.1 million.
[320] Although obviously, if we assume pass-through is less than 100%, by definition less than this will be passed on to consumers.
[321] It is worth noting that, if MCPs are correct and many consumers choose to disconnect their mobile subscription, then this could increase the number of fixed-only households. However, we do not consider that this is likely to happen.

Figure A3.8: Fixed-only ownership rates[322]



Source: Ofcom; data from Q1 each year except 2005-2007 (inclusive) where it is for Q2

A3.311 Figure A3.8 shows the trend in fixed-only ownership by vulnerable groups compared to the population as a whole. This shows that a greater proportion of adults on low incomes and in the DE socio-economic group are fixed-only compared to the general population. However, fixed-only ownership has been declining for all three groups. The decline in fixed-only ownership in the general population has been slowing, with little change since 2007. The same is broadly true for the DE socio-economic group, with fixed-only ownership declining rapidly at the start of the period, and then flattening out from 2007 onwards. However, among low income households, fixed-only ownership still appears to be declining rapidly.

A3.312 Therefore, a significant proportion of vulnerable consumers are fixed-only (although this is declining). This is likely to be the case at the end of the next charge control period as well as discussed below.

A3.313 O2 argued[323] that the majority of vulnerable fixed-only consumers will be on the BT Basic package, as this is specifically designed for those on limited incomes (and in fact argued that 60% of all fixed-only consumers may be on this tariff in 2015). However, we note that BT Basic is only open to those on selected state benefits. While these may be some of the most disadvantaged consumers, they are not the only vulnerable consumers.

A3.314 There are approximately 2m fixed-only households, and just under ✂ consumers on BT Basic. This suggests that BT Basic accounts for more like ✂ of fixed-only households. O2 predicts that there will be approximately 1 million fixed-only households in 2015 (which, on the assumption that the amount of BT Basic accounts remained constant would suggest around 60% of fixed-only households on these accounts in 2015). However, we think that O2's forecast declines in fixed accounts are overstated. As described above, the decline in fixed-only households

[322] The proportion of respondents who are not willing to reveal their income fluctuates year on year. Therefore, trends amongst low income groups should be treated with caution, as year-on-year comparisons will not necessarily compare like with like.
[323] Paragraphs 208 to 213 of O2 response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/O2.pdf

seems to be slowing, and so it is not clear that the number of fixed-only households will decline as steeply as O2 suggested, or that BT Basic consumers will account for a significantly greater proportion of these households than today.

A3.315 Therefore, there are a number of fixed-only consumers who are not on BT Basic. As we note above, BT Basic is not open to all vulnerable consumers, and so some of these non-BT Basic fixed-only consumers are likely to be vulnerable consumers. These consumers will gain from the general benefits to fixed consumers which we explore in Section 7.

A3.316 In terms of the benefit to those on BT Basic, O2 argued[324] that, as this is a regulated product, it is not subject to competitive forces, and so any competitive pressure which may be exerted on FCPs to reduce their prices (which it does not expect to occur in any event) would not extend to this tariff and so would not benefit vulnerable fixed consumers. O2 highlighted that in fact BT has secured regulatory approval to increase the BT Basic subscription charge in line with inflation.

A3.317 O2 considers that this inflationary increase is an indication that BT does not face competitive pressures in the provision of BT Basic and, consequently, there is no reason to believe that BT Basic customers will benefit from MTR reductions. We accept that, as a regulated product, BT Basic is not subject to the same competitive pressures as other tariffs. However, as O2 noted, it requires regulatory approval to change the tariff, which would have to be justified.

A3.318 In addition, calls which are made outside the BT Basic inclusive call package (such as calls to mobiles) are charged at BT's standard network rates. Therefore, where BT Basic consumers make calls outside their call package, some of the benefits which may accrue through lower fixed call prices would benefit these consumers as well. However, we noted in Section 7 that savings from lower MTRs may be channelled into bundle prices rather than towards reducing the price of calls outside of bundles. In so far as this might happen, this would be less likely to benefit BT Basic consumers.

Conclusion on vulnerable fixed consumers

A3.319 It is likely that, to the extent that consumers of fixed services benefit, those vulnerable consumers who are fixed-only and not on BT Basic are likely to benefit as well. Those who are on the BT Basic tariff already benefit from lower prices for basic fixed services (as a result of being on this tariff) and may benefit from reductions in standard network rates for services outside of the BT Basic inclusive package to the extent such reductions arise.

Overall conclusion on vulnerable consumers

A3.320 We consider that the equity effects related to reduced mobile ownership (and to a lesser extent higher mobile prices) among (mobile-only) vulnerable consumers are not likely to be significant, particularly when benefits to other (fixed-only) vulnerable groups are taken into account. Therefore, we do not consider equity effects to be a significant factor in the choice between LRIC+ and pure LRIC.

[324] Paragraphs 212 of O2 response to our April 2010 consultation at http://stakeholders.ofcom.org.uk/binaries/consultations/wmctr/responses/O2.pdf.