Wholesale Mobile Voice Call Termination

Statement

1 June 2004

Contents

[1] Under sections 48(1) and 79(4)of the Communications Act 2003

Summary

S.1 The Communications Act 2003 ("the Act") provides for functions, powers and duties to be carried out by Ofcom which include, inter alia, functions, powers and duties flowing from the new EU Communications Directives. Those particular functions, powers and duties in the Act were, up to 29 December 2003, exercised by the Director General of Telecommunications (referred to below either as "the Director" or "Oftel")

S.2 Those Directives require National Regulatory Authorities ("NRAs"), amongst other things, to carry out reviews of competition in communications markets to ensure that regulation remains appropriate in the light of changing market conditions.

Consultations

S.3 In line with the new EU Communications Directives, on 15 May 2003 Oftel published a consultation document entitled *Review of mobile wholesale call termination markets* (referred to throughout this document as "the May consultation"). In that document, Oftel explained that the Director was reviewing competition in the provision of wholesale mobile call termination, and included proposals for identifying markets, making market power determinations and setting significant market power ("SMP") conditions on six mobile network operators ("MNOs"); O2, Orange, T-Mobile, Vodafone, '3' and Inquam. The period of consultation closed on 24 July 2002;14 responses were received (13 non-confidential).

S.4 Having considered responses to the May consultation, on 19 December 2003 Oftel published a Notification (under sections 48(2) and 80 of the Act) and Explanatory Statement. This set out revised proposals and invited responses from those likely to be affected. The period of consultation ended on 10 February 2004 (extended from 6 February). With functions including the undertaking of this review being passed to the Office of Communications ("Ofcom") on 29th December 2003, Ofcom received 10 representations issued by interested parties in response to the Oftel Notification and Explanatory Statement.

S.5 These responses included a submission from the European Commission, who, along with other NRAs, was sent the draft decisions in accordance with Article 7 of Directive 2002/21/EC on a common regulatory framework for electronic communications networks and services (the "Framework Directive") and sections 50 and 51 of the Act. In its response, the European Commission did not exercise its powers under Article 7(4) of the Framework Directive to take a decision requiring Ofcom to withdraw the proposals.

Summary of conclusions

S.6 Having considered all responses, Ofcom has identified the markets set out below, and has concluded that each MNO has SMP in the market for the provision of wholesale voice call termination on its individual network(s):

- wholesale voice call termination provided by '3' (such termination provided via '3''s mobile network);

- wholesale voice call termination provided by Inquam (such termination provided via Inquam's mobile network);

- wholesale voice call termination provided by O2 (such termination provided via O2's mobile network);

- wholesale voice call termination provided by Orange (such termination provided via Orange's mobile network);

- wholesale voice call termination provided by T-Mobile (such termination provided via T-Mobile's mobile network); and

- wholesale voice call termination provided by Vodafone (such termination provided via Vodafone's mobile network).

S.7 As a result of these conclusions, Ofcom has set out SMP conditions to be imposed on the six MNOs in Schedules 1, 2, 3 and 4 to the Notification at Annex A. The proposed SMP conditions to be imposed vary between different sets of MNOs to reflect their different positions as mobile operators.

Regulatory remedies

S.8 Given the position of dominance held by all providers of mobile voice call termination services – i.e. their ability to behave to an appreciable extent independently of competitors, customers and ultimately consumers – Ofcom is imposing the following SMP conditions:

S.9 In respect of Vodafone, O2, T-Mobile and Orange for their 2G call termination services, requirements that they:

- provide network access (i.e. 2G call termination) on reasonable request;

- do not unduly discriminate in relations to matters connected with such network access;

- supply to Ofcom copies of any new or amended access contracts;

- give advance notification of price changes; and

- reduce termination charges in line with charge controls.

S.10 In respect of Inquam, a requirement that it gives advance notification of price changes.

S.11 In respect of 2G voice call termination services provided by '3', a requirement that it gives advance notification of price changes and supplies to Ofcom details of call volumes.

S.12 Ofcom has concluded that there should be no ex-ante regulation of 3G voice call termination services.

S.13 In relation to 2G voice termination, Vodafone, O2, Orange and T-Mobile ('the four MNOs') should be subject to a charge control, to last until 2006 (details of the proposed control can be found in Chapter 6).

Final steps

S.14 In line with paragraphs 9 and 22 of Schedule 18 to the Act, current relevant regulation contained in the Continuation Notices given by the Director in July 2003 shall be discontinued by way of issuing Discontinuation Notices to the relevant MNOs (and other operators where relevant). The Discontinuation Notices given in respect of regulation replacing the charge controls shall take effect on 2 September 2004 i.e. the day after the charge controls take effect. The Discontinuation Notice given in respect of other relevant regulation shall take effect in accordance with section 7 of the Interpretation Act 1978 and section 394(7) of the Act. Details of this discontinuation can be found in Chapter 7 of this statement, with copies of the Notices posted on 1 June 2004 at Annex G.

Chapter 1

Introduction

1.1 This review considers the markets for wholesale mobile voice call termination services.

1.2 Prior to this review, these markets were reviewed as part of a Monopolies and Mergers Commission investigation in 1998, an Oftel review of the controls on Vodafone and O2 (then Cellnet) in 2000/01 and a Competition Commission ("CC") investigation in 2002.[2] This background is discussed in more detail in paragraphs 1.2 – 1.8 of the December consultation.

A new regulatory regime

1.3 A new regulatory framework for electronic communications networks and services entered into force on 25 July 2003. The framework is designed to create harmonised regulation across Europe and is aimed at reducing entry barriers and fostering prospects for effective competition to the benefit of consumers. The basis for the new regulatory framework is five new EU Communications Directives:

- Directive 2002/21/EC on a common regulatory framework for electronic communications networks and services ("the Framework Directive");

- Directive 2002/19/EC on access to, and interconnection of, electronic communications networks and associated facilities ("the Access Directive");

- Directive 2002/20/EC on the authorisation of electronic communications networks and services ("the Authorisation Directive");

- Directive 2002/22/EC on universal service and users' rights relating to electronic communications networks and services , ("the Universal Service Directive") and;

- Directive 2002/58/EC concerning the processing of personal data and the protection of privacy in the electronic communications sector ("the Privacy Directive").

1.4 The Framework Directive provides the overall structure for the new regulatory regime and sets out fundamental rules and objectives which read across all the new directives. Article 8 of the Framework Directive sets out three key policy objectives which have been taken into account in the preparation of this consultation document; namely promotion of competition, development of the internal market and the promotion of the interests of the citizens of the European Union. The Authorisation Directive establishes a new system whereby any person will be generally authorised to provide electronic

[2] *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, presented to the Director General of Telecommunications* ("CC report"), December 2002

communications services and/or networks without prior approval. The general authorisation replaces the former licensing regime. The Universal Service Directive defines a basic set of services that must be provided to end-users. The Access and Interconnection Directive ("AID") sets out the terms on which providers may access each others' networks and services with a view to providing publicly available electronic communications services. These four Directives were implemented in the UK on 25 July 2003. This was achieved via the Communications Act 2003 ("the Act").The fifth Directive on Privacy establishes users' rights with regard to the privacy of their communications. This Directive was adopted slightly later than the other four Directives and was implemented by Regulation which came into force on 11 December 2003.

Market reviews

1.5 The new Directives require National Regulatory Authorities ("NRAs") such as the Office of Communications ("Ofcom") and previously the Director General of Telecommunications (referred to in this document as "the Director" or "Oftel") to carry out reviews of competition in communications markets to ensure that regulation remains appropriate in the light of changing market conditions. This document is part of the ongoing market review process which Oftel commenced in anticipation of the new regime.

1.6 Each market review has three parts:

- a definition of the relevant market or markets;
- an assessment of competition in each market, in particular whether any companies have Significant Market Power ("SMP") in a given market; and
- an assessment of the appropriate regulatory obligations which should be imposed where there has been a finding of SMP.

1.7 More detailed requirements and guidance concerning the conduct of market reviews are provided in the Directives, the Communications Act, and in additional documents issued by the European Commission, Oftel and Ofcom.

Consultation processes

1.8 The consultation process for this market review began with the consultation published by Oftel on 15 May 2003. The Director published, in the May consultation, a Notification under the Electronic Communications (Market Analysis) Regulations 2003, setting out proposals for identifying markets, making market power determinations and setting SMP conditions on O2, Orange, T-Mobile, Vodafone, '3' and Inquam. The document invited comments over a 10 week period on the proposals for the definition of relevant markets, market power determinations and the setting of new SMP conditions.

1.9 A second stage of consultation began on 19 December 2003 ("the December consultation"). This consultation updated the analysis based on market developments and responses to the first stage of consultation. This second stage of consultation, which closed on 10 February 2004, invited representations from UK stakeholders and from the European Commission and other NRAs, in accordance with Article 7 of the Framework Directive (2002/21/EC).

1.10 In accordance with Article 7 of the Framework and the European Commission's Recommendation on notifications, time limits and consultations of 23 July 2003, Ofcom also sent the European Commission a summary notification form of its draft proposals. Ofcom's notifications are published on the European Commission's website at: http://forum.europa.eu.int/Public/irc/infso/ecctf/library?l=/&vm=detailed&sb=Title

EC Commission "Recommendation on relevant product and service markets" adopted on 11 February 2003 ("the Recommendation")

1.11 The European Commission identified in the Recommendation a set of markets in which ex ante regulation might be warranted. The Recommendation seeks to promote harmonisation across the European Community by ensuring that the same product and service markets are subject to a market analysis in all Member States. However, NRAs are able to regulate markets that differ from those identified in the Recommendation where this is justified by national circumstances. Accordingly, NRAs are to define relevant markets appropriate to national circumstances, taking due account of the product markets listed in the Recommendation (see section 79 of the Act), which Ofcom has done.

EC Commission "Guidelines on market analysis and the assessment of SMP" ("the Guidelines")

1.12 The European Commission has also issued Guidelines on market analysis and the assessment of SMP ("SMP Guidelines")[3]. Oftel produced additional guidelines on the criteria to assess effective competition (see www.ofcom.org.uk/static/archive/oftel/publications/about_oftel/2002/smpg0802.htm). Ofcom has taken due account of the SMP Guidelines (in accordance with section 79 of the Act), and the Oftel guidelines when identifying a services market and when considering whether to make a market power determination under section 79 of the Act.

Regulation pending the completion of market reviews

1.13 The new Directives also allow Member States to carry forward some existing regulation until the market reviews have been completed and new conditions put in place. Continuation Notices were therefore issued to relevant communications providers to maintain the effect of certain provisions contained in licence conditions that existed under the Telecommunications Act 1984 prior to 25 July 2003 until, inter alia, the market review process is finished. Further details on this continuation regime were published by Oftel and can be found at: www.ofcom.org.uk/static/archive/oftel/publications/eu_directives/2003/discont1003.pdf

[3] "*Commission Guidelines on market analysis and assessment of significant market power under the Community regulatory framework for electronic communications networks and services*" which can be found at http://europa.eu.int/information_society/topics/telecoms/regulatory/new_rf/index_en.htm.

Ofcom's decision on the markets following this review

1.14 Ofcom has now identified the following markets in the UK in accordance with section 79 of the Act:

- wholesale voice call termination provided by '3' (such termination provided via '3''s mobile network);
- wholesale voice call termination provided by Inquam (such termination provided via Inquam's mobile network);
- wholesale voice call termination provided by O2 (such termination provided via O2's mobile network);
- wholesale voice call termination provided by Orange (such termination provided via Orange's mobile network);
- wholesale voice call termination provided by T-Mobile (such termination provided via T-Mobile's mobile network); and
- wholesale voice call termination provided by Vodafone (such termination provided via Vodafone's mobile network).

1.15 Following the December consultation and Ofcom's consideration of responses to that consultation, Ofcom has decided that these are still the appropriate market definitions. The European Commission also indicated to Ofcom in its response to the December consultation that it considers that the product market definition does not differ from that in the Recommendation. This is discussed in greater detail in Chapter 2.

1.16 As set out in the previous consultations, the market reviews are required to be forward looking in their analysis. It is envisaged that there will be another market review of the services covered by this review in 18-24 months and therefore the analysis looks forward over that time period.

1.17 As set out in the Notification at Annex A, Ofcom has made market power determinations in respect of each market to the effect that each MNO has SMP in the market for call termination on its individual network or networks. Following those market power determinations, Ofcom has decided that the MNOs should be subject to SMP conditions, as set out below. In respect of Vodafone, O2, T-Mobile and Orange for their 2G call termination services, the SMP conditions require that they:

- provide network access (i.e.2G call termination) on reasonable request;
- do not unduly discriminate in relations to matters connects with such network access;
- supply to Ofcom copies of any new or amended access contracts;
- give advance notification of price changes; and
- reduce termination charges in line with charge controls (details of which can be found in Chapter 6 of this statement).

1.18 In respect of Inquam, a requirement that it gives advance notification of price changes.

1.19 In respect of 2G voice call termination services provided by ‘3’, a requirement that it gives advance notification of price changes and supplies to the Ofcom details of call volumes.

Existing regulation

1.20 Copies of Discontinuation Notices posted on 1 June 2004 are included at Annex G to this explanatory statement. These Notices shall take effect on the appropriate date depending on when the new relevant SMP conditions come into force. The Notices are given to:

- O2 and Vodafone, discontinuing Conditions 70B and 70C (Control of Interconnection Charges: Fixed to Mobile and Mobile to Mobile respectively);
- Orange and T-Mobile, discontinuing Conditions 70A and 70B (Control of Interconnection Charges: Fixed to Mobile and Mobile to Mobile respectively);
- Vodafone, ntl Limited and MCI Worldcom Limited, discontinuing an Interconnection direction made on 16 July 2003 in respect of a dispute over Vodafone’s credit vetting abuse.

Outline of this document

1.21 This statement should be read in conjunction with the May and December consultations for the full reasoning for Ofcom's decision.[4] Ofcom has considered the responses to the December consultation carefully and taken utmost account of the points made when setting out in this statement its final decision on market definition, the making of market power determinations and the setting of SMP conditions. The rest of the document is structured as follows:

- Chapter 2 defines the relevant markets;
- Chapter 3 sets out Ofcom’s conclusions on whether there is SMP in those markets;
- Chapter 4 discusses the detrimental effects arising from holding such SMP;
- Chapter 5 sets out what regulatory remedies Ofcom is imposing in the markets where SMP has been found;
- Chapter 6 discusses the charge controls to take effect;
- Chapter 7 sets out the process for discontinuing existing regulation;

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[4] Although the May and December consultations were published by Oftel, this document refers to Ofcom throughout unless referring to specific publications issued by Oftel such as consumer surveys, guidelines etc. prior to Ofcom's receiving its powers under the Communications Act.

- Annex A contains the Notification under sections 48(1) and 79(4) of the Act containing Ofcom's final decision on the identification of relevant markets, the making pf market power determinations and the setting of SMP conditions;

- Annex B discusses cost of capital;

- Annex C provides an explanation of the LRIC target charge;

- Annex D provides an evaluation of the surcharge externality to be applied in the charge controls;

- Annex E discusses the treatment of ported numbers;

- Annex F provides a glossary of the terms used in this statement; and

- Annex G contains the discontinuation notices given to relevant operators.

Notification

1.22 Annex A contains the notification under sections 48(1) and 79(4) of the Act of Ofcom's decisions as a result of the review of the mobile call termination market, including the markets defined, the designation of SMP and the conditions that will be imposed as a result of the market analysis.

1.23 This document, including the notification in Annex A, has been made accessible to the European Commission and to the Regulatory Authorities in other Member States in accordance with the scheme of the Directives and sections 50 and 81 of the Act.

Chapter 2

Market Definition

Introduction

2.1 Ofcom does not propose to alter the market definitions that were proposed in the December consultation. The relevant markets were defined to be wholesale voice call termination on each MNO's network (or, where the MNO operates both 2G and 3G networks, across both networks).

2.2 This market definition has been debated extensively over the past 2 years, including during the 2002 inquiry by the CC, as well as in this Market Review. Hence, a summary of the rationale for the market definitions is now presented. This is followed by Ofcom's responses to points made in response to the December consultation. Interested parties should also refer to the May consultation (Chapter 3) and the December consultation (Chapter 2 and Annex A), where further supporting evidence and discussion of relevant points made in earlier submissions can be found.

Market definition: wholesale voice call termination on each individual mobile network

2.3 In Chapter 3 of the May consultation, and Chapter 2 (paragraphs 2.9-2.16) and Annex A of the December consultation, the relevant market definition was proposed as wholesale voice call termination on each MNO's network (or, where the MNO operates both 2G and 3G networks, across both networks). This was done in accordance with Oftel's normal approach to setting market boundaries (see paragraphs 2.2 to 2.8 of the December consultation).

2.4 The market definition for call termination is closely linked to the calling party pays (CPP) arrangement. As the calling party pays the entire price for a mobile voice call, there is a disconnection between the person paying for the calls (and so, indirectly, for the termination charge) and the person who makes the choice of the terminating network and could thereby influence the level of the termination charge (i.e. the called party).

2.5 The overall effect of this CPP arrangement in the relevant retail markets is that, while MNOs have an incentive to keep the price of those services required and paid for by the subscriber at a level to attract and retain customers, they have less incentive to keep the price of calls to mobiles from other fixed or mobile networks low.

2.6 In the wholesale market, the effect of the CPP arrangement is similar. For fixed-to-mobile calls, MNOs have little incentive to keep voice call termination charges low, because the fixed operator will pay a high charge – either because they have an obligation to, or because they have a commercial interest in ensuring that all calls made by their subscribers are terminated. For off-net mobile calls (i.e. from one MNO's network to another), MNOs pay each other for termination of calls and there is little incentive to keep termination charges low (because higher charges are passed through into the competing MNOs' retail prices).

2.7 More formally, Ofcom considers that no adequate wholesale supply or demand side substitutes for termination of calls to the subscribers of a specific MNO currently exist. Current technology does not allow the termination of a call to a mobile other than on the network of the MNO to which the called party subscribes. This appears unlikely to change in the near future. At the retail level, Ofcom is of the view that, at present, there are no effective alternatives for callers that could act as a constraint on termination charges. In addition, callers appear to have limited awareness of the cost of calling mobiles. There is a minority of mobile users that shows a higher elasticity to the price of incoming calls.[5] However, MNOs have segmented these users by offering them special tariffs, thus preventing this group from putting any effective pressure on the generality of termination charges levied on fixed operators and other MNOs. Technological conditions and the behaviour of called and calling parties may change over time, but Ofcom believes that this is extremely unlikely to happen in the next two to three years. Hence, Ofcom believes that, at present, there are separate markets for voice termination on each MNO's network(s). A more detailed discussion of the markets and Ofcom's reasoning can be found at Annex A of the December consultation.

2.8 Ofcom's conclusion is therefore that the supply of wholesale voice call termination on each individual mobile network constitutes a separate market, and that the geographic extent of each network is also the geographic extent of each relevant market. It is not expected that this market definition would change over the period to 2006.

2.9 The December consultation proposed that voice calls terminating on 2G and 3G networks (where owned by the same MNO) should be considered as being in the same market. This view was on the basis that, although termination on a 2G network and termination on a 3G network were not substitutable, for commercial and technical reasons a common price was likely to be levied for termination on either network. This pricing policy would imply that the originating operator would pay the same price for voice call termination on an MNO's 2G or 3G network. Therefore, it would be reasonable to include them in the same economic market.

2.10 As there was some doubt as to the consistency of this definition with that proposed by the European Commission in the Recommendation (see paragraph 16 of the Annex to the Recommendation), Oftel notified the European Commission that it had identified markets which were potentially different from the Recommendation.

Responses to the December consultation

2.11 There were a significant number of responses to the May consultation on market definition issues from MNOs, and these responses were addressed in the December consultation (see Chapter 2 and annex A). Although these

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[5] The evidence presented in previous consultations is still consistent with more recent evidence produced by Ofcom. For example, Ofcom's February 2004 survey of mobile users (forthcoming) found that, on an unprompted basis, only 2 per cent of users mentioned that one of the reasons for choosing a particular network was that it would be cheaper for others to call them. Only 9 per cent claimed that the cost of other people calling them was a significant factor in choosing their network, and that only 11 per cent had actually found out how much it would cost people to call them.

issues were not further raised in response to the December consultation, Ofcom is aware that disagreement remains between Ofcom and the MNOs on the scope of the appropriate market definition, with MNOs generally preferring a wider market definition (including both retail (access and origination) services as well as wholesale termination services).

2.12 Further responses to the December consultation on market definition issues were essentially limited to two points:

- Vodafone indicated that it did not believe it was correct to conclude that there was no supply-side substitution between the termination services of the various MNOs; and

- BT questioned whether voice call termination on 2G and 3G networks should be considered to be in the same economic market.

Supply-side substitution

2.13 Vodafone's comments can be summarised as follows:

"There is a clear economic linkage between origination and termination services which are provided over a common infrastructure. This means that it is wholly wrong for Oftel to conclude that there is no supply-side substitutability between the termination services of the various MNOs. In paragraphs A85 to A90 of Annex A to the Draft Notification Oftel rejects the possibility of supply-side substitution but does so ignoring the realities of the mobile telecommunications market(s)…

The service we are considering is the termination of voice calls on the Vodafone network. In paragraph A88, Oftel states that: "having a mobile network is not sufficient for an MNO to be able to terminate calls to the subscriber of a rival network.

This is plainly false. If Orange or O2 wishes to provide termination services to a Vodafone customer, they can do so quite readily by winning the customer and offering Orange or O2 services. The fact that termination is one of a number of services in the package cannot change the reality that other suppliers exist and that they are competing hard to win such customers, for example by offering subsidised handsets or attractive call charges." (Vodafone, paragraphs1.3-1.6)

2.14 Ofcom does not consider Vodafone's analysis to be correct. The logic of market definition is to consider whether substitution possibilities (demand- and supply-side) undermine the ability of a hypothetical monopolist to raise the price of its wholesale termination service. This does not occur here. Vodafone argues that MNOs respond to a small but significant non-transitory increase in price ("SSNIP") of wholesale termination by competing for that customer. But this is not sufficient to constrain the termination price, as it is not subject to competitive pressure. Put another way, considering a broad supply-side substitution of services to consumers does not change the ability of a hypothetical monopolist to sustainably raise prices for the (narrower) termination service. This ability to raise prices stems from the lack of demand- or supply-side substitutes for a consumer facing an increase in the price of termination services – that is, the consumer purchasing the fixed-to-mobile or mobile-to-mobile call.

2.15 Vodafone's argument would only hold if the consumer purchasing retail mobile-to-mobile or fixed-to-mobile calls (which use a wholesale termination service) also purchased retail mobile services from that supplier. But the CPP arrangement ensures that the party purchasing termination is not the same party who chooses the mobile network on which that call is terminated – ensuring that the 'field of competition' in which mobile operators compete for customers does not extend to termination services. Ofcom therefore does not believe Vodafone's analysis is supportive of a broader market definition. The appropriate market definition is not changed by the fact that any excessive profits generated in call termination may subsequently be competed away.

2.16 Ofcom notes that its market definition and analysis of supply-side substitutes is consistent with that of the CC[6] and the European Commission.

2G and 3G markets

2.17 BT comments on the combined 2G/3G market definitions:

"A2…Thus, call termination is considered to form one market based on the assumption that there will be common pricing by mobile network operators for 2G and 3G voice call termination.

A3 BT believes it is methodologically incorrect to define markets on the basis of an assumption about how suppliers will behave. As we describe below, we also believe it unlikely that the assumption will apply in practice. This will inter alia impose costs on end-users and so be in conflict with the regulatory objectives laid down in Article 8 of the Framework Directive.

A4 In its Explanatory Statement, Oftel concedes (paragraph A.107) that if different charges were to be payable in respect of 2G and 3G termination, there would be a case for defining separate markets. However, Oftel states that this would make no difference to the SMP designation, nor to the 'proportionate remedies'. This is a conclusion that BT would dispute, for the reasons described in section B below."

2.18 The European Commission also commented on these definitions:

"The Commission is of the view that it is uncertain whether Oftel's assumptions on a common pricing policy would prove to be correct in practice [footnote] Oftel to a large extent bases its assumption on the current pricing behaviour of "3" and on the other mobile network operators' statements." (European Commission, page 4)

2.19 As noted in paragraph 2.9, the market definitions were proposed on the basis of an assumption about the likely behaviour of MNOs once they had operational 3G networks over which voice call termination services could be supplied. In relation to '3', the market definition was proposed on basis of '3''s current behaviour.

2.20 The nature of the market review program which Ofcom has undertaken is forward-looking in nature. That is, the development of markets with and without ex ante obligations over the next two years must be considered. Ofcom believes the market definition process therefore inevitably requires informed judgements as to the likely nature of MNO behaviour.

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[6] See paragraph 2.147 of the CC report.

2.21 Ofcom considered the responses of MNOs on their likely behaviour when supplying voice call termination services over their 3G networks. These responses suggested there were likely to be both technical and commercial reasons why they would be unable to set separate charges for 2G and 3G termination services. The likelihood that there would be a common pricing constraint for 2G and 3G termination suggested that it would be appropriate to put these services in the same market (where they were supplied by the same operator). Ofcom therefore considers that, on the basis of currently available information, it would not be appropriate to define separate markets.

2.22 In addition to the substantive comments above, Ofcom also notes that the European Commission stated that it did not believe the markets defined in the December consultation were in fact different from the markets identified in its Recommendation:

"Based on the draft measure and the additional information provided by Ofcom, the Commission concludes that the product market definition does not differ from that in the Commission's Recommendation on relevant markets." (European Commission response, p. 2)

Conclusions

2.23 Ofcom has concluded that, having taken due account of the Recommendation and the SMP Guidelines, as well as Oftel's guidelines on assessing effective competition in carrying out this review, there are six separate relevant markets as follows:

- wholesale voice call termination provided by Vodafone (such termination provided via Vodafone's mobile network);
- wholesale voice call termination provided by O2 (such termination provided via O2's mobile network);
- wholesale voice call termination provided by T-Mobile (such termination provided via T-Mobile's mobile network);
- wholesale voice call termination provided by Orange (such termination provided via Orange's mobile network);
- wholesale voice call termination provided by '3' (such termination provided via '3''s mobile network); and
- wholesale voice call termination provided by Inquam (such termination provided via Inquam's mobile network).

2.24 As indicated by the European Commission, these market definitions are consistent with those in the Recommendation.

2.25 These market definitions are without prejudice to any economic analysis that may be carried out in relation to any investigation or decision pursuant to the Competition Act 1998 (relating to the application of the Chapter I or II prohibitions or Article 81 or 82 of the EC Treaty) or the Enterprise Act 2002. See paragraph 2.49 of the December consultation for further information.

Chapter 3

Market power

SMP assessment in the markets for wholesale mobile voice termination

3.1 This section contains Ofcom's final conclusions on the assessment of SMP in the markets for wholesale mobile voice call termination. In this section, Ofcom responds to the comments made in response to the December consultation. Further details of Ofcom's reasoning for its decision on SMP, and of the analysis performed by Ofcom to arrive at the conclusions presented below, are available in Chapter 3 (paragraphs 3.9-3.45) of the December consultation and Chapter 4 and Annex B of the May consultation.

Criteria used in assessing SMP

3.2 In its assessment of SMP in the markets for voice call termination, Ofcom has focused on single firm dominance and has relied on four of the criteria[7] listed in the SMP Guidelines[8] and in Oftel's Guidelines[9] on the assessment of SMP. These criteria are:

(a) market share;

(b) ease of market entry;

(c) excessive prices and profitability; and

(d) countervailing buyer power.

3.3 Ofcom has also considered the CPP arrangements – a key factor in shaping the competitive conditions prevailing in the wholesale mobile voice call termination markets.

3.4 The rest of this section presents separately Ofcom's conclusions on the position in the markets for mobile voice termination of the MNOs Vodafone, Orange, O2 and T-Mobile, the new entrant '3' and Inquam. Even though Ofcom has reached similar conclusions for all six MNOs, these are discussed separately to highlight the differences in the analysis.

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[7] These four criteria are only a subset of the criteria listed in the EU Commission and Oftel Guidelines on SMP. Annex B in the May consultation discusses the other criteria and explain why they have been considered to be less relevant in this specific market.

[8] "*Commission Guidelines on market analysis and assessment of significant market power under the Community regulatory framework for electronic communications networks and services*" which can be found at http://europa.eu.int/information_society/topics/telecoms/regulatory/new_rf/index_en.htm.

[9] "*Oftel's market review guidelines: criteria for the assessment of significant market power* " which can found at http://www.ofcom.org.uk/static/archive/oftel/publications/about_oftel/2002/smpg0802.htm

Ofcom's conclusions on Vodafone, Orange, O2 and T-Mobile

3.5 Ofcom considers that Vodafone, Orange, O2 and T-Mobile each have SMP in the market for mobile voice termination on their 2G (and, where services are offered, their 3G) networks. This is due to the fact that the CPP arrangement and existing technologies prevent other providers from offering termination services on a specific network. This is an absolute barrier to entry. Hence, each MNO faces no actual or potential competition in the supply of termination services on its own network(s). This means that each MNO is, in effect, a monopolist.[10] This is further addressed in paragraphs 3.11-3.16 of the December consultation.

3.6 In addition, Ofcom believes that there is insufficient countervailing buyer power on the part of any originating operator (fixed or mobile) to off-set the ability of these MNOs to act independently of their customers, and to prevent them from setting excessive termination charges. See paragraphs 3.32-3.45 of the December consultation for further detail.

3.7 This SMP finding has been further supported by Ofcom's analysis of 2G voice call termination charges, which appear to have been substantially above a reasonable estimate of each MNO's costs for a number of years, despite both formal and informal regulation. This ability to keep prices persistently and profitably above the competitive level is a further, important, indicator of SMP. In addition, Ofcom considers that, in the absence of any ex-ante regulation (or threat of ex-post regulation), the MNOs would have an incentive and ability to set even higher termination charges (i.e. at the profit-maximising level - which may be at 20 pence per minute or more). See paragraphs 3.17-3.31 of the December consultation for further detail.

3.8 Ofcom has also considered whether there is scope for competition to develop in the provision of termination services in the future. It has concluded that it will depend on how mobile technology and consumers' behaviour develop, and that it is unlikely that the necessary developments will take place before 2006. For further detail refer to Annex D of the December consultation.

Responses to the December consultation

Links between the market for access and origination and the market for termination

3.9 In its response, Vodafone (paragraphs 1.9 to 1.15) argues that, as Ofcom has concluded that the market for mobile access and origination services is effectively competitive[11], no MNO can have SMP in the mobile termination markets. Vodafone claims that, if the retail market is competitive, the MNOs are effectively prevented from keeping any excess profit they may gain in the

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[10] Each MNO has (since launch of its services) a 100% share of terminating voice calls on its 2G network, both when measured by volume of calls and by revenues. As services on 3G networks are launched (as have been by '3'), each MNO running a 3G network will also have a 100% share of terminating voice calls on that network.

[11] *Discontinuing regulation: mobile access and call origination market*, Oftel 4 November 2003

mobile termination markets and, therefore, are deprived of the independence that characterises dominance.

3.10 Vodafone argues that:

"…there is a clear and undisputed link between the pricing of termination services and access/origination services. The existence of this waterbed effect means that the pricing of Vodafone's and the other MNOs' termination and access/origination rates are subject to the same economic pressures, namely competition for subscribers." (Vodafone, paragraph 1.14)

3.11 Hence, it concludes that the resulting structure of prices – with relatively high termination charges and relatively low retail prices – is the outcome of a competitive process. Vodafone also argues that:

"…one can argue about the welfare effects of such a structure, but it is wrong to characterise this as a situation where one UK MNOs can act independently of the other MNOs in setting any price, whether for termination or access and origination services." (Vodafone, paragraph 1.15)

3.12 Vodafone claims that this dynamic is also recognised by Tommaso Valletti in his study on the telecoms markets prepared for DG Information Society[12], where he states:

"…if there is competition among MNOs, then the termination profits would be passed on to mobile users, for instance via lower rental fees or via cheaper handsets, and the excess profits are competed away." (Valletti, p.18)

3.13 Hence, Vodafone concludes that Ofcom cannot hold that there is effective competition in the UK market for mobile access and origination services while maintaining that all UK MNOs can set termination prices independently of each other, as the two conclusions are contradictory.

Ofcom's response

3.14 Ofcom is aware of the links between the retail access and outgoing calls market and the termination markets and has considered them in its analysis. Indeed, the justification for having an externality surcharge in the termination charge relies on this very link. However, Ofcom does not agree with Vodafone's conclusions. As discussed in Chapter 4 of the May consultation (paragraphs 4.23-4.25 and 4.38–4.44), competition in the retail market merely determines the extent to which the profits earned in the market for termination services are competed away through lower retail prices. It does not take away from an MNO its ability to set excessive termination charges. This ability is derived from its SMP position. The independence of action that characterises an operator with SMP manifests itself, among other things, in its freedom to set charges well above cost.

3.15 In Ofcom's view, the extent to which competition forces an MNO to lower retail prices and competes away most of the excess profits it earns in the termination market is a relevant consideration in the analysis of the detrimental effects of

[12]"*Access Services to Public Mobile Networks*", Dr. Tommaso Valletti, September 2003

excessive termination charges and in the determination of proportionate remedies. However, it does not affect the assessment of SMP[13].

3.16 Ofcom also considers that, if read in its totality, the paper by Tommaso Valletti supports Ofcom's, rather than Vodafone's, analysis. Valletti does not argue that MNOs cannot have SMP in termination if the retail market is competitive, but simply points out the link between the two markets. In fact he clearly states that:

"…the mobile operator is typically able to set charges at the monopoly (i.e. profit maximising) level independently of the intensity of competition in the market for subscribers." (Valletti, p. 17)

3.17 Hence, Ofcom does not consider that Vodafone's argument weakens its SMP analysis.

SMP and 3G networks

3.18 BT claims that Ofcom's analysis:

"…is based on the assumption that network operators will levy the same charges on 3G termination as they do for 2G termination. The basis of Oftel's resulting proposal is that cost-orientation of 2G call termination would then safeguard consumers by also applying when consumers make a call terminating on a 3G network. This implies to us that Oftel has effectively defined two separate markets (one for 2G and one for 3G), but found the mobile operators not to have SMP in the market for 3G termination on the basis that there will be a spill-over of the regulatory remedies from 2G to 3G." (BT, paragraph B2)

3.19 BT also argues that:

"…the underlying competition problem for voice call termination on 3G networks is exactly the same for such termination on 2G networks and gives rise to the same public interest concerns and Oftel has provided no argument why the type of technology used by the mobile supplier alters the mobile operators' market power". (BT, paragraph B5)

Ofcom's response

3.20 Ofcom does not agree with BT's conclusions. Ofcom has not defined two separate markets for termination on an MNO's 2G and 3G network, nor has it found no SMP in the latter market for each MNO. Ofcom, as identified in paragraph 2.23 above, has defined a single market for mobile voice termination services on both the 2G and the 3G network of each of Vodafone, Orange, O2 and T-Mobile, and this is unchanged from the December consultation. The SMP finding applies to the provision of all the services included in this market. As BT has correctly pointed out, the reasoning behind the SMP finding is independent of the technology used, therefore, Ofcom considers that Vodafone, Orange, T-Mobile and O2 have SMP in the provision of termination

[13] See Chapter 4 (paragraph 4.38 to 4.44) in the December consultation for more details about the 'waterbed' effect.

on both their networks. The issue of which obligations should be introduced to remedy this SMP is discussed further in Chapter 5 on Remedies.

Ofcom's conclusion on the new entrant: '3'

3.21 Ofcom maintains its view that '3' has SMP in the market in which it supplies wholesale mobile termination services. Ofcom considers that (i) '3''s 100 % market share in the market for wholesale voice call termination on its network; and (ii) the presence of absolute barriers to entry in that market, mean that '3' has SMP.

3.22 In addition, Ofcom believes that purchasers of termination from '3' have insufficient buyer power to off-set '3''s market power, and thus constrain its pricing behaviour.

Response to the consultation

3.23 In its response to the consultation, '3' claims that Ofcom's analysis of whether '3' has a position of SMP in the wholesale mobile voice call termination market is highly generalised and unduly aligned to the analysis for the existing 2G mobile operators. '3' also indicates that it does not believe Ofcom has taken into account all of the relevant evidence and submissions provided by '3'.

3.24 Ofcom considers that the basic analysis of voice call termination on mobile networks is consistent across all MNOs, and believes that it has taken sufficient account of '3''s evidence and submissions. Ofcom now addresses the specific points raised by '3' in response to the December consultation.

BT's countervailing buyer power

3.25 '3' claims that Ofcom's analysis of whether BT has countervailing buyer power in the market for mobile termination on '3''s network is "cursory and inadequate" and highlights a number of weaknesses (paragraphs 2.9 to 2.32 of '3''s response).

3.26 '3' also argues that Ofcom bases its claim that BT has no countervailing buyer power on BT's obligation to purchase call termination. However, '3' states that in the Oftel guidance document *End to End Connectivity*[14] it is acknowledged that BT has no obligation of this kind.

3.27 In addition, '3' claims that Ofcom focuses solely on whether BT can refuse to purchase termination, and ignores its ability to cause material delays in the negotiation process. According to '3', this is a major shortfall in the analysis, because BT, in agreeing termination charges, has exploited the fact that '3', as a new entrant, could not even commence essential network testing without an interconnection agreement with BT. Hence, '3' argues that, even if BT may not be able to refuse interconnection, it is able to threaten to delay negotiations.

3.28 '3' concludes by suggesting that a further proof of BT's countervailing buyer power is that the terms of the contract between '3' and BT prevent changes to '3''s charges. The contract subjects any change in interconnection charges to

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[14] Published in May 2003.

BT's approval, and, where no agreement is reached, the matter may be referred to Ofcom. Hence '3' believes that, in any renegotiation of termination charges, BT will refer any attempt by '3' to raise charges excessively to Ofcom.

Ofcom's response

3.29 Ofcom believes it has taken account of all relevant evidence supplied by '3'.

3.30 In relation to the point about BT's countervailing buyer power, Ofcom does not believe that the existing regulatory framework would, in practice, allow BT (as an originating operator) to reject price increases by '3'. While, as '3' has pointed out, there are no formal conditions in place – because they have not previously been required – the May guidance explains that BT is expected to offer end-to-end connectivity in order to meet USO requirements to provide publicly available telephone services. This weakens BT's bargaining position as it removes the threat of BT not providing connectivity if agreement over charges cannot be reached.

3.31 It is possible that during the initial interconnection negotiations between BT and '3', '3''s urgency to launch services was a relevant factor in the relative bargaining positions of each party. However, Ofcom's analysis in this market review must be forward-looking and consider '3''s likely position in the next 18-24 months. Therefore, Ofcom must also consider future negotiations between '3' and BT.

3.32 With such a forward-looking perspective, and with delay not such a critical issue for '3', it would be difficult to argue that '3' could not set excessive charges for the termination services provided to BT. With specific regard to '3''s evidence, Ofcom believes that it refers to the specific circumstances which '3' was in prior to offering services to the public. However, it does not provide a sufficient indication of how future negotiations with BT would run, given the change in '3''s circumstances (i.e. previously it required an interconnection agreement with BT to start operating, but that is no longer the case). It may be that existing contractual arrangements between '3' and BT make it difficult for '3' to raise charges from their current level. However, there is no arrangement in this contract for BT to ensure that charges fall over time from their current level (in line with costs). Some evidence of this is BT's inability to enforce reduced termination payments to '3' at the time of the 15 per cent charge reduction applied to the other MNOs in July 2003.

3.33 Hence, for the reasons set out above Ofcom considers that BT is under an obligation which leads to a position where it does not have countervailing buyer power that off-sets '3''s market power in call termination.

MNOs' countervailing buyer power

3.34 In its response, '3' complains that the Director has not examined in detail the bilateral relationships between '3' and the other MNOs:

"…especially as Ofcom expressly recognises elsewhere in the Notification that there is an imbalance of market power between '3' on the one hand and the four incumbents on the other". ('3', paragraph 2.24)

3.35 '3' claims that because of: (i) its small size;(ii) the competitive threat that it represents for the MNOs; and (iii) the clear urgency for '3' to obtain interconnection from them, Orange, Vodafone, T-Mobile and O2 have countervailing buyer power.

3.36 ‘3’ also holds that the MNOs do not necessarily have to cut off ‘3’ to exert their buyer power, but that they could delay negotiations or make them more resource intensive.

3.37 Furthermore, '3' argues that there is an inconsistency between Ofcom’s SMP finding and Ofcom’s position (paragraph 5.44 in the December consultation) that

“…whilst (the four) MNOs may have an incentive to weaken ‘3’ ’s position in the retail mobile market by charging ‘3’ very high termination rates, Ofcom would not expect ‘3’ to have the same interest as most of its traffic is off-net”.

Ofcom's response

3.38 In the December consultation (paragraphs 3.37 and 3.40) Ofcom considered the individual relationship between all six MNOs and concluded that it is unclear whether any of them has a level of buyer power sufficient to off-set each MNO’s monopoly in providing termination and constrain their charges to a cost-reflective level. Ofcom expressed the view that it would be the exception rather than the rule that the level of countervailing buyer power in these bilateral negotiations would be of the precise magnitude to ensure that voice call termination charges were constrained to the competitive level, and that it had not been provided with any evidence to show anything to suggest that the position is otherwise. Ofcom currently sees no reason to alter this view.

3.39 The December consultation (paragraph 3.44) noted that there were commercial considerations which limited the countervailing buyer power of MNOs. Aside from these commercial considerations, Ofcom also considers that, in relation to whether an operator has countervailing buyer power, the threat of regulatory intervention is relevant. Any failure by Vodafone, Orange, O2 or T-Mobile to purchase call termination from ‘3’ may trigger a regulatory intervention under section 73 of the Act. Ofcom considers that this implicit regulatory threat curbs any countervailing buyer power the MNOs may have in the market for voice termination services on ’3’’s network.

3.40 Furthermore, as mentioned above, the analysis performed in this review is forward-looking; hence, Ofcom considers that, having launched its services, ‘3’ is no longer under pressure to enter into new interconnection agreements. The threat to delay is primarily effective when there is no interconnection agreement in place. Therefore, any delaying tactics on the part of another MNO is unlikely to be an effective strategy to exert power in future interconnection negotiations.

3.41 Hence, Ofcom considers that there is no compelling evidence (either from a theoretical point of view, or having considered in detail ‘3’'s submission) that any of these MNOs has a level of buyer power sufficient to off-set ‘3’’s market power in the provision of termination on its network.

3.42 With regard to the comment made by Ofcom in paragraph 5.44 of the December consultation about ’3’’s position, this was related to the justification for not imposing a non-discrimination obligation. Ofcom believes that Vodafone, Orange, O2 and T-Mobile may have an incentive to raise termination charges to ‘3’, not simply to maximise profits from termination services, but also to reduce its ability to compete with them in the retail market. Each of Vodafone, Orange, O2 and T-Mobile has a large subscriber base and offers low rates for on-net calls between customers on its network. This means that by charging a new entrant a high charge for termination they are able to exploit the size of their customer bases as a competitive weapon in the retail market. By contrast, ‘3’, which presently has a small subscriber base in the retail market, does not have the same opportunity to use discrimination in the termination market to its advantage in the retail market.

Excessive prices

3.43 ‘3’ considers that Ofcom:

“…has manifestly failed to give proper individual consideration to the question of whether Hutchison 3G can set excessive call termination prices.” (‘3’, paragraph 2.4)

3.44 ‘3’ also questions whether Ofcom’s analysis of the MNOs’ behaviour in setting 2G voice termination charges and its conclusion that these charges have been set above a reasonable estimate of each MNO’s costs for a number of years applies also to ‘3’. ‘3’ argues that the December consultation contains no analysis of its costs that could have led Ofcom to conclude that ’3’’s charges are excessive. In addition, ‘3’ claims that it has provided Ofcom with evidence that demonstrates that its pricing is not excessive.

3.45 In addition, ‘3’ considers that Ofcom has not given enough consideration to the effects of the current number portability arrangements on ‘3’’s ability to set charges above the competitive level. In particular '3' claims that the effect of the number portability charging arrangements curbs any pricing freedom it may have. [Confidential text redacted]

Ofcom’s response

3.46 The analysis of 2G termination charges Ofcom presented in Chapter 4 of the December Consultation was limited to the charges levied by Vodafone, O2, Orange and T-Mobile. Ofcom is aware that ‘3’’s termination charges in practice reflect a combination of its 2G and 3G termination costs, and Ofcom has not performed a detailed analysis of ‘3’’s charges. As Ofcom has noted, 3G networks are new and capable of providing a range of innovative services, and therefore it would be difficult to assess with confidence the relevant voice call termination costs and the appropriate rate of return on capital invested. However, this does not imply that ‘3’ is unable to set excessive termination charges, given the lack of constraints it faces. The constraints facing ‘3’ are similar in nature to those facing the other MNOs, and these are not sufficient to hold charges at the competitive level on a forward-looking basis.

3.47 With regard to the evidence submitted by ‘3’, this did not include any information on ‘3’’s termination costs and, more importantly, it only refers to ported numbers for which ‘3’, like all the other MNOs, receives a different termination charge from its own. This charging arrangement is the result of the current technical routing system agreed between the MNOs. This (imperfect) system has been set up because of the high cost of implementing a system that would permit terminating operators to receive their own termination charge.

3.48 The presence of ported numbers will not preclude MNOs from setting excessive termination charges to those subscribers that have not ported their number. Therefore, Ofcom is of the view that the fact that ‘3’ currently cannot set charges for terminating a share of calls to its network does not justify concluding that ‘3’ (nor any of the other MNOs) has no pricing freedom in setting charges for customers without ported numbers.

3.49 With regard to ‘3’’s roaming agreement with O2, Ofcom considers that, to the extent that it has constrained ‘3’’s termination charges, the effect is likely to be transitory and short-term. This is because, in Ofcom’s understanding, the agreement was struck to ensure that ‘3’’s customers had sufficient network coverage in the time before ‘3’’s network is completed. Hence, this feature will be of declining importance over the period to 2005/06.

Regulatory constraints

3.50 ‘3’ claims that it submitted evidence to indicate that the threat or use of dispute resolution processes had constrained its own pricing and would continue to do so for the foreseeable future, but that Ofcom has dismissed this without any consideration.

Ofcom’s response

3.51 Ofcom believes it has already addressed this issue in paragraphs 4.3 to 4.9 of the December consultation, where it was explained that the possibility of dispute resolution will not, in practice, constrain a MNO from setting excessive termination charges. Ofcom provides further reasoning on this point in the following chapter (see paragraph 4.14).

Ofcom’s conclusions on Inquam

3.52 Ofcom remains of the view that Inquam has SMP in the market for mobile voice termination supplied on its network. Ofcom considers that, because of the presence of absolute barriers to entry (see above) and the lack of countervailing buyer power, Inquam does not face sufficient constraints on its pricing behaviour in the market for voice call termination services.

Response to the consultation

3.53 The European Commission pointed out that Inquam’s subscribers are predominantly small and medium enterprises, which may be sensitive to the cost of customers calling them and may therefore limit Inquam’s freedom to set excessive termination charges. The European Commission also suggested that Ofcom may wish to take account of Inquam’s prior pricing behaviour.

Ofcom’s response

3.54 Ofcom is aware that the existence of ‘closed user groups’, i.e. groups of people whose members care about the cost to the other members of calling their mobile number, could mitigate the effect of the CPP arrangement and act as a constraint on the MNOs’ ability to set excessive voice termination charges. However, Ofcom considers that, in general, the presence of closed user groups does not limit an MNO’s pricing freedom in the relevant wholesale termination market. This is because the MNO can offer special retail tariffs to these price-sensitive customers, ensuring that these calls remain ‘on-net’ (i.e. they also originate on Inquam’s network), and maintain excessive charges for the supply of wholesale termination services to other fixed and mobile operators.

3.55 Ofcom understands that a very high proportion of calls terminated on Inquam's network are 'on-net', and that the services offered by Inquam primarily consist of private networks that allow those on it to communicate with each other. Inquam effectively enables these customers to bypass the excessive wholesale termination charges that would be paid if calls were terminated 'off-net'. Hence, Inquam's customers rarely receive off-net calls as all the parties they regularly communicate with are already on the network.

3.56 Ofcom therefore accepts that Inquam's customer base is composed largely of closed user groups, who are able to apply competitive pressure on termination charges. Nonetheless, Ofcom concludes that for calls which are originated on other networks (off-net), Inquam faces the same lack of constraints on its wholesale termination charges as do the other MNOs.

3.57 Ofcom also requested and received information from Inquam on its wholesale termination charges. While Ofcom has not undertaken a study of costs, in order to determine whether these charges are excessive, the fact that these charges are above the regulated charges of the other MNOs appears consistent with Ofcom's market analysis and SMP finding.

Conclusions

3.58 After taking into account further responses, Ofcom concludes that each mobile operator has SMP in the market for the supply of wholesale mobile voice call termination on its network(s).

Chapter 4

Detrimental effects arising from SMP in termination markets

Introduction

4.1 The previous chapter set out Ofcom's decision on SMP in the markets for mobile voice call termination services. In Chapter 5 of the May consultation, and Chapter 4 of the December consultation, there was a discussion of the evidence in relation to the likely detriments arising from SMP in mobile termination markets (in addition to proposals for an SMP finding).

4.2 Ofcom does not intend to re-visit these arguments in detail in this statement. Rather, a summary of Ofcom's position is provided, together with references to earlier consultations, followed by a discussion of points raised specifically in response to the December consultation.

Summary of position

4.3 Ofcom's view is that in the absence of regulation, the SMP held by the MNOs would lead to excessive termination charges. See paragraphs 4.3-4.9 of the December consultation for further discussion.

4.4 Ofcom believes that these excessive charges would lead to detriments for consumers, and that the 'waterbed' or 'swings and roundabouts' effect – by which excess profits from termination services may be returned to mobile users via lower retail prices – does not provide a justification for the structure of charges that would arise in the absence of regulation.

4.5 The first reason for concern is that the 'waterbed' effect may not be complete, i.e. competition in the retail market may not be sufficient to drive out all of the excess profit. If this was the case, then the benefit from reducing excessive termination charges would be clear, as it would prevent MNOs persistently earning excess profits overall. However, even assuming there was a complete 'waterbed' effect, there are four other relevant detrimental effects from excessive termination:

- the resulting reduction in economic efficiency;
- the undesirable distributional effects;
- the distortion of consumer choice; and
- the increased risk of anti-competitive behaviour.

4.6 These were outlined in some detail in the May and December consultations (see Chapters 5 and 4 respectively)

Responses to the December consultation

The likelihood that MNOs would set excessive termination charges

4.7 Orange submits that termination charges are subject to a 'downward ratchet effect' (Orange submission, page 3), and that the only appropriate 'base case' when considering regulation is the current level of charges. In Orange's view, it is a 'simple fact that absent (mobile voice call termination service) specific regulation no mobile operator could unilaterally increase its wholesale charges…'. Orange argues that it could only increase charges with BT's consent, which would be unlikely. This would mean that a dispute – and dispute resolution by Ofcom – is the only plausible outcome. Orange alleges that Ofcom has misinterpreted its powers to resolve disputes, and claims that it is open to Ofcom to refuse to allow an operator to increase its prices in resolving a dispute, whether or not that operator has SMP. Orange therefore claims that Ofcom has made a material error of fact in assuming that, in the absence of regulation, MNOs would raise their CTM rates to levels in excess of 20 pence per minute ("ppm").

4.8 Ofcom believes these points have been partially addressed in the December consultation (see paragraphs 4.3-4.9). The two (related) issues raised again are whether BT has countervailing buyer power, given its regulatory obligations, and whether dispute resolution would provide any additional constraint on an MNO's charges once a finding of 'no SMP' has been made.

4.9 Orange identifies BT's countervailing buyer power as a potential source of pressure on an MNO's charges. As discussed in paragraph 3.30 of this document, Ofcom does not believe that the existing regulatory framework would, in practice, allow BT (as an originating operator) to reject price increases by disconnecting an operator without SMP.

4.10 On the issue of what might happen if a dispute is raised, Ofcom cannot, as a matter of law, fetter its discretion in resolving a dispute. However, Ofcom rejects (what appears to be) Orange's main rationale in raising this allegation. Namely, Orange seems to be suggesting that it is always open to Ofcom to resolve a dispute by making a determination under section 190 of the Act prohibiting the relevant price increase to be made. Ofcom disagrees with that view.

4.11 Any determination by Ofcom resolving such a dispute must be aimed at achieving the policy objectives in Article 8 of the Framework Directive (see the Community requirements in section 4 of the Act). Furthermore, Article 20(3) of the Framework Directive also makes it clear that any obligations that Ofcom imposes in resolving the dispute must respect the provisions of the new Directives. Thus, in the light of these provisions, Ofcom needs to form a view as to what is the appropriate way of exercising all of its powers under the Act in the circumstances of each case.

4.12 As mentioned above, the December consultation addressed the efficiency and appropriateness of dealing with excessive termination charges via ex post regulation. In particular, paragraph 4.7 of the December consultation explained the extensive compliance and monitoring requirements entailed in the development and implementation of cost-based prices, indicating that ex ante regulation is likely to be preferable in this case.

4.13 Furthermore, the implication of Orange's suggestion above appears to be that price increase disputes could be referred frequently to Ofcom. If so, given the need for timely intervention and legal certainty across the industry, Ofcom considers that reliance on its powers to resolve disputes would not be the most appropriate way to achieve the objectives set out in Article 8.

4.14 In this context, Ofcom notes it has the power to resolve the price increase dispute in question by determining that it will not prevent the increase until it has exercised its powers to set, inter alia, an SMP condition (see section 190(4) of the Act). Accordingly, Ofcom does not accept that it has made a material error of fact in rejecting dispute resolution as a constraint on the MNOs' ability to price excessively.

4.15 T-Mobile also claims that the 'unregulated' charge scenario used in the December consultation in the cost-benefit analysis of regulation is implausible. It suggests that charges as high as 24.6ppm would not occur because:

"(a) the assumed level is substantially above the level (13.42ppm) that existed prior to regulatory intervention[15];

(b) since 1998, unit costs have fallen and there are now greater competitive pressures on termination;

(c) termination charges in markets that have remained unregulated have fallen significantly; and

(d) one operator was willing to commit to the CC not to increase its termination rates whilst another was willing to commit to gradually reduce its rates." (T-Mobile, Part II, paragraph 29)

4.16 Ofcom notes the termination charge of 24.6ppm is an estimate derived from the Rohlfs model[16] as being the monopoly price. While this would require a significant increase over current charges, and it may take some time for charges reach this level, Ofcom does not consider charges of this order of magnitude to be implausible in the absence of regulation. This view is consistent with evidence Vodafone presented to the CC inquiry (or 'CC report'[17]) that, given the level of competition in the retail market, MNOs would be subject to pressures to set excessive charges, and that these charges could rise as high as 17-20ppm (see paragraph 2.441). Ofcom does not believe it can attach significant weight to evidence supplied by T-Mobile and Orange as to the previous level of charges, as these charges were set in the context of the informal regulatory pressure that existed prior to the imposition of formal

[15] Orange also claims that prior to 24 July 2003 charges were unregulated and in the region of 10.8ppm.

[16] The Rohlfs model refers to work undertaken by its consultant, Dr Jeffrey Rohlfs, on models of efficient pricing. For a description of this work, see *A model of prices* and *costs of mobile network operators,* 22 May 2002, available from the Ofcom website.

[17] *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, presented to the Director General of Telecommunications*, December 2002

regulation on these MNOs (formal regulation has been applied to Vodafone and BT Cellnet / O2's termination charges since at least 1995).

4.17 On T-Mobile's other points, while unit costs have fallen over the past few years, the estimate in the Rohlfs model uses estimates of incremental costs for 2005/06. Consequently, forecast reductions in unit costs are already accounted for in this estimate. Secondly, Ofcom is not aware of evidence that suggests that, in countries using the CPP arrangement, charges for mobile termination have fallen significantly in the absence of formal (or informal) regulation. Finally, the commitment by some MNOs not to increase charges suggests that this was likely to be a more favourable remedy for these MNOs than the alternative remedy (LRIC-based charging) that could have been – and was – proposed by the CC.

4.18 Ofcom therefore continues to believe that excessive termination charges would be set by MNOs in the absence of regulation. To the extent that the charge may not be as excessive as the monopoly level of 24.6ppm derived in the Rohlfs model, this will be relevant in considering the robustness of the cost-benefit (welfare) analysis. This is further addressed in the Charge Control chapter (paragraph 6.105).

Reduction in economic efficiency

4.19 Both the May and December consultations outlined the analysis of the efficiency losses resulting from excessive termination charges. Essentially, the losses result from the unbalanced structure of prices, leading to under-consumption of retail services which use wholesale termination services as inputs, and over-consumption of other mobile services.

4.20 Orange and T-Mobile both comment critically on the cost-benefit analysis, with neither believing that the analysis (presented in Annex L of the December consultation) provided sufficient support for price controls. These criticisms were essentially that (a) Oftel's models understated the efficient charge for mobile termination, and (b) Oftel's "unregulated charge" scenario was implausible. T-Mobile also suggests that an assumption of excess profits, built into the cost-benefit analysis, was responsible for the result of welfare gains from regulation.

4.21 Ofcom has addressed the issue about the likelihood of excessive charges in the absence of regulation in the section above. Issues about the level of the 'efficient charge', incorporating LRIC, common cost recovery and an externality adjustment, have been addressed in much detail in both the May and December consultations. Notwithstanding issues which are further addressed in this document (see the Charge Control chapter), Ofcom believes that all of the relevant concerns of the MNOs have been addressed and that it is highly unlikely that the 'efficient charge' used in the welfare analysis is understated.

4.22 On T-Mobile's point about the 'assumption' of excess profits, Ofcom rejects the proposition that such an assumption is responsible for the result of welfare gains from regulation. As noted in the December consultation (paragraph L.34), the welfare comparison is between two scenarios – one scenario where mobile termination charges are high, and one in which they are capped by regulation – which are both explicitly zero-profit outcomes. That is, the measurement of the gain from regulation in no way relies on reductions in MNO profits.

Undesirable distributional effects

4.23 The December consultation set out the view that excessive termination charges were likely to have undesirable distributional consequences (paragraphs 4.21-4.37). Primarily, this was because there was an identifiable group (those who only owned a fixed phone) that paid high termination charges, but received no benefit from low mobile prices. This group was predominantly lower income.

4.24 Orange comments that the discussion in the December consultation was largely qualitative, and should have incorporated a quantitative assessment of distributional issues similar to the one it provided to the CC. T-Mobile comments extensively on this issue, suggesting at one point that Oftel, in proposing a price control, was "preferring a distributional goal over a consumer-welfare maximising one" (Part I, paragraph 3(a)) and that the price control was "based on Oftel's apparent desire to create a transfer from certain classes of consumers (broadly, net callers from mobiles) to other classes of consumers (broadly, net callers to mobiles)" (Part II, paragraph 18). T-Mobile also alleges Ofcom's approach is inconsistent with its obligations under the Act, questions whether fixed-only households are adversely affected by excessive termination charges, and whether it could be said that fixed-only households were worse off than mobile-only households.

4.25 It should be clear from the May (see, for example, paragraph 5.8) and December consultations (see, for example, paragraph 4.56) that the proposals in this document are not primarily designed to address distributional concerns. T-Mobile is therefore incorrect when it states that Oftel's desire was to create transfers, or that Oftel preferred a distributional goal over a consumer welfare-maximising one. It was explained in the December consultation (paragraph 4.24) how the consideration of distributional effects fits in with the duties of Ofcom under the Act and the focus on the maximisation of benefits to end-users. Moreover, the December consultation set out in paragraph 5.161 the reasons why Ofcom considers the section 47 test has been satisfied in relation to the imposition of charge control. Further, in paragraph 5.160 Ofcom sets out why it believes the other relevant tests for the charge controls that are in the Act have been satisfied. Ofcom does not believe that T-Mobile's submission (Part II paragraphs 18-22) on its view of Ofcom's further obligations contains further points of relevance.

4.26 With regard to the evidence of the distributional effects of termination charges, again this was discussed in some detail in the December consultation (which contained further references to the CC inquiry). Ofcom's position is that it considers that it should take account of the fact that, even if there was a full waterbed effect, there are certain groups of consumers that are made substantially worse-off by excessive mobile termination charges. These groups (i.e. those who only use a fixed-line phone, or payphones) are predominantly lower-income.[18] The four MNOs seek to 'offset' this detriment by emphasising the benefits conferred on mobile-only users by excessive termination charges

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[18] Ofcom also notes that these many of these users do call mobile phones. Oftel submitted to the CC in 2002 that 59% of fixed only households make calls to mobiles. This means that about 3 million (12%) UK households make calls to mobiles from a fixed phone but do not own a mobile phone. See http://www.ofcom.org.uk/static/archive/oftel/publications/mobile/ctm_2002/distribution120202.pdf for more information.

and consequent lower retail mobile prices. Ofcom does not, however, accept that it should therefore ignore the detriments to fixed-only users, and refrain from correcting the currently distorted pricing structure – which gives rise to substantial transfers towards mobile-only users – on the basis of the distributional benefits to these mobile-only users. As explained in paragraph 4.24 of the December consultation, Ofcom believes that this approach is in compliance with its duties under the Act.

Effects on consumer choice

4.27 Excessive termination charges feed through into higher retail prices for fixed-to-mobile and mobile-to-mobile (off-net) calls. However, on-net calls have no explicit termination charge, and mobile-to-fixed calls have a regulated (fixed) termination charge. Consequently, the view was expressed in the May and December consultations that consumers' choices are distorted between mobile and fixed calling, potentially driving consumers to use the higher resource-cost technology and reducing efficiency. It was commented that, in the longer term this was likely to distort competition between fixed and mobile operators.

4.28 T-Mobile claims that Oftel did not give serious consideration to the dynamic effects of its proposals; in particular, the impact on competition between MNOs and between the MNOs and BT.

4.29 Ofcom rejects T-Mobile's interpretation, and notes that in the December consultation specific consideration was given to both issues it refers to (see paragraphs 4.17-4.20 and 4.45-4.50 of the December consultation). In relation to competition between MNOs, Ofcom does not believe there are compelling reasons to believe regulation of termination charges would diminish competition markedly between MNOs. The regulatory proposals are designed to be competitively neutral between MNOs. In relation to the potentially higher switching barriers, Ofcom does believe it is important that consumers are able to switch between operators relatively freely. However, this does not justify artificially stimulating switching behaviour through excessive termination charges and below-cost subscription and handset prices. This would risk encouraging competition for its own sake, rather than because it delivers outcomes likely to be in the interests of end-users. To the extent that the price of mobile termination services better reflect costs, competition in retail markets is likely to be more effective in delivering outcomes favourable to all consumers.

4.30 In relation to the competition between MNOs and BT, Ofcom does not believe it would be sensible to encourage competition between MNOs and BT by providing MNOs with favourable regulatory treatment. Rather, Ofcom considers that sustainable competition and substitution between fixed and mobile services by consumers should be driven by the underlying costs of the technologies, facilitated by a neutral regulatory environment. There would be serious doubts as to the sustainability of competition between MNOs and BT if it were underwritten by the excessive pricing of mobile termination services purchased by fixed operators – whose own call termination charges are regulated.

Risk of anti-competitive behaviour

4.31 In paragraphs 4.51-4.55 of the December consultation, it was suggested that higher termination charges could increase the risk of anti-competitive behaviour by MNOs. Primarily, this was because other fixed and mobile operators used termination services as an input into retail services which were also sold by the MNO. While it was not claimed that any particular behaviour would necessarily be anti-competitive, it was noted that the greater the gap between wholesale price and cost, the greater the risk that certain types of behaviour (e.g. discrimination) would have an anti-competitive effect in retail markets.

4.32 T-Mobile claims that, contrary to Oftel's view, implementing a charge control will harm competition rather than reduce the risk of anti-competitive behaviour. It contends that it will reduce competitive pressure on BT, will reduce switching in the retail market, and favour 900 MHz operators (Vodafone and O2) over combined 900/1800 MHz operators (T-Mobile and Orange).

4.33 Ofcom has addressed T-Mobile's points in relation to competition between BT and MNOs and between MNOs in paragraphs 4.29 and 4.30 above. Ofcom rejects the suggestion that the proposed charge control favours any one type of operator – this is addressed in the Charge Control chapter (paragraphs 6.50-6.52) in more detail.

Incomplete pass-through of excessive termination charges to consumers

4.34 In the May and December consultations, it was noted that the 'waterbed' argument relied on the excessive profits earned by MNOs being competed away in retail markets. Although no SMP finding was made in relation to any of the MNOs in the retail mobile market, Oftel did not feel sufficiently confident to conclude that conditions were such as to ensure that the MNOs would always feed through excessive profits earned in supplying termination services into lower prices for retail mobile services. See paragraphs 4.38-4.44 of the December consultation.

4.35 T-Mobile made a number of comments on Oftel's position.

The proposition that the current level of prices generates excess profits is used, inter alia, as a justification for regulation, to reject Ramsey pricing, to choose a very low value for the externality surcharge and to prop up Oftel's Cost-Benefit Analysis….Despite the proposition being a key part of Oftel's analysis, Oftel puts forward absolutely no evidence to support it. (T-Mobile, Part II, paragraph 26)

4.36 Ofcom rejects the notion that excess profits at the current level of prices are a key proposition in the regulation of mobile termination charges. As a first point, the issue is not one primarily about profits at the current level of prices – rather, the relevant consideration is whether, if termination charges were unregulated, the profits earned would be returned in the markets for retail mobile services.

4.37 Over time, as the retail market has become more competitive, it has become less likely that MNOs will be able to hold on to excess profits earned in supplying termination services. Nonetheless, Ofcom believes that in a market with a limited number of competitors and significant entry barriers (due to spectrum scarcity), it is unlikely that this pass-through would be complete, as it would imply that MNO profits are invariant to the level of termination charge. And, indeed, were this to be the case, the MNOs would be unconcerned about the level of termination charges. In fact, it is apparent that they are far from indifferent about their level, which calls into question their claims that termination profits would always be completely bid away in the retail market.

4.38 Secondly, as is made clear in the December consultation (paragraph 4.44), whether or not there is a complete 'waterbed' effect is not a definitive issue – that is, there are other arguments which support regulation even if the profits earned from excessive termination charges were completely competed away. Excess profits are also not used to underpin Ofcom's analysis of the other issues mentioned by T-Mobile, and these comments are dealt with in the appropriate sections of this Statement.

'3' and Inquam

4.39 '3' commented that Oftel did not specifically establish any detrimental effects associated with '3''s pricing of termination services, as it believed its prices had been effectively constrained. This is commented on in the previous chapter on SMP. Ofcom's position is that where excessive charges are set for termination services, there will be detrimental effects. Obviously, the magnitude of the detriment (and the proportionate remedies) will depend both on an operator's subscriber numbers and the proportion of calls to its subscribers that involve the supply of wholesale termination services. This is one reason for the decision to impose 'lighter' remedies on '3' and Inquam than on the other MNOs. However, to the extent that detriment exists (or is likely to exist), Ofcom believes that some remedies will be necessary to ensure that charges are constrained.

Conclusion

4.40 Ofcom does not consider that the arguments made in submissions to the December consultation provide sufficient justification for preserving excessive termination charges. In particular, the 'waterbed' effect (even if complete) does not provide a sufficient justification, fundamentally because it results in a structure of prices that is detrimental to economic efficiency and the interests of end-users. Additionally, excessive termination charges are likely to produce adverse distributional outcomes, distort the development of fixed and mobile competition, and increase the risk of anti-competitive behaviour. Consequently, Ofcom believes that there are likely to be adverse effects from excessive mobile termination charges, and believes this risk is sufficient to meet the tests in section 88(1) of the Act (on the setting of a charge control).

Chapter 5

Regulatory remedies

Introduction

5.1 Chapter 5 of the December consultation set out proposals for ex ante regulation to address each MNO's SMP.

5.2 This chapter sets out Ofcom's conclusions on regulatory remedies, and discusses the responses to the December consultation proposals.

Charge controls for 2G termination services

5.3 In paragraph 6.15 of the December consultation, Ofcom proposed an RPI-X cap on the charges for 2G mobile voice call termination of O2, Orange, T-Mobile and Vodafone to run from 1 April 2004 to 31 March 2006. This proposal is described in detail at Chapter 6 and Annex I of the December consultation. Having considered responses to the December consultation, Ofcom still considers that consumers will, on the whole, be made substantially better off by the regulation of mobile termination charges and Ofcom has concluded that a charge control, applied from 1 September 2004 until 31 March 2006, for 2G voice call termination services is still appropriate.

5.4 As set out in paragraphs 6.4 to 6.10 of the December consultation, Ofcom has set the target charge on the basis of LRIC plus a mark-up for common costs, based on the equal proportionate mark-up (EPMU) approach, and a network externality surcharge. However, rather than applying a glide path over the period of the control, Ofcom has concluded, for the reasons set out in chapter 6, that it is now appropriate for termination charges to be reduced directly to an efficient charge level for 2005/06 in the first period of the charge control.

5.5 The efficient charge level is set (in nominal terms) at 5.63ppm and 6.31ppm for combined 900/1800MHz and 1800MHz MNOs respectively. Full details of the charge control can be found in Chapter 6 of this statement.

5.6 In responding to the December consultation, the four MNOs put forward arguments against the imposition of the proposed charge controls. These are discussed below. Points concerning the assessment of detriments, and the charge control calculations and cost-benefit analysis are discussed separately in Chapter 4 and Chapter 6 of this document respectively.

"Retrospection"

5.7 In their responses, Vodafone, 02, Orange and T-Mobile all argue that the December consultation unlawfully and unreasonably proposes a charge control that is 'retrospective' or 'backward-looking' and hence is disproportionate.

Ofcom's response

5.8 Ofcom notes that the objective of the charge control proposals is to ensure that termination charges are lowered to an efficient level (the efficient charge). This aim is necessarily forward-looking. The method by which the proposed charge controls might reduce MNOs' current termination rates over the control period –

such as via a glide path – is simply a mechanism by which these rates reach the fair target charge. This is set out clearly in Annex H of the December consultation, in particular paragraph H.12.

5.9 The objective of the charge control proposed in the December consultation remains unchanged from the May consultation. The same objective applies in relation to the charge controls set out in this statement.

5.10 The purpose and effect of the charge controls is forward-looking. Ofcom therefore does not accept the argument that the charge controls are retrospective. Hence, it does not accept that in setting such controls Ofcom is acting ultra vires, nor does it accept that its proposals are *Wednesbury* unreasonable. In paragraphs 5.94 and 5.161 of the December consultation, Ofcom explains why it considers that the control is proportionate and meets the tests in section 47(2) of the Act.

5.11 Chapter 6 (paragraphs 6.74-6.103 of this statement) deals with the path of reductions to the efficient charge. Paragraphs 6.91-6.92 relate specifically to the MNOs' arguments that the path of reductions to the efficient charge in the December consultation effectively involved a retrospective charge.

"Ofcom in breach of Framework Directive by delaying the setting of SMP conditions"

5.12 Related to the issue of 'retrospection', T-Mobile's response to the December consultation argues that Ofcom's delay in deciding whether to set SMP conditions breaches paragraph 9(11) of Schedule 18 of the Act and Article 16(1) of the Framework Directive (T-Mobile, Part I paragraph 15).

Ofcom's response

5.13 Ofcom has a duty under paragraph 9(11) of Schedule 18 to the Act to take all steps necessary for enabling it to decide whether or not to set new conditions. It must do this as soon as reasonably practicable after giving a continuation notice. One of those steps is to consider fully all responses made to the relevant consultations, which Ofcom has done. Ofcom therefore does not accept that it has acted in breach of its duties under either paragraph 9(11) of Schedule 18 of the Act. A similar duty is contained in Article 16(1) of the Framework Directive i.e. to carry out market analysis "as soon as possible" after the adoption of the Recommendation. Again, Ofcom does not accept that it has acted in breach of this duty, having dealt with responses to both consultations on mobile voice call termination as quickly as possible, consistent with its obligations to give full consideration to all responses.

"Pass-through"

5.14 In their responses, Orange and Vodafone raise concerns that a proposed charge control reducing the fixed-to-mobile termination rates paid by fixed network operators ("FNOs") would not necessarily be reflected in the retail rates FNOs set for their customers. Thus, should FNOs not pass through the perceived savings to consumers making fixed-to-mobile calls, the rationale for a charge control is not met. The suggestion is thus that a charge control is disproportionate.

5.15 In section 2.1 of its response, Orange disputes that sufficient steps have been taken by Ofcom to ensure pass-through. This view is also expressed by Vodafone in paragraph 1.42 of its submission. Orange in particular focuses on BT, arguing that Ofcom has allowed BT such flexibility so that BT is able to retain the benefits of any reductions in fixed-to-mobile termination charges. Orange further submits that Ofcom's policy (as set out in paragraphs 5.92 to 5.93 of the December consultation) is wrong in law, and that Ofcom is unable to direct BT to ensure pass-through. Orange alleges that Ofcom does not have the power to modify SMP conditions except where there has been a material change in circumstances so as to warrant a modification, and that Ofcom's policy is to regulate BT's retention 'by the back door' and lacks transparency.

Ofcom's response

5.16 Ofcom does not agree that on the basis of the 'pass-through' argument above, the proposed charge control is disproportionate. For reasons set out in paragraphs 5.95 to 5.103 of the December consultation and in Chapter 4 and Chapter 6 of this statement, Ofcom considers the proposed charge controls appropriate in response to a finding of SMP and an assessment of the distortion associated with SMP in the relevant wholesale market(s). Problems associated with excessive pricing in retail markets are, in the first instance, more appropriately addressed in other market reviews (for example, the fixed narrowband retail services market review of August 2003: http://www.ofcom.org.uk/static/archive/oftel/publications/eu_directives/2003/fix_narrow_retail0803.pdf)

5.17 Ofcom does not accept the view that absent a specific pass-through requirement, the charge control will be ineffective in achieving its stated aim (Orange, pages 27 and 28) and would fail to meet the section 47(2) test of the Act. As stated earlier (paragraph 5.10), Ofcom believes that in imposing the charge control set out in this document, it has satisfied the section 47(2) test.

5.18 Ofcom explained its views on pass-through in paragraphs 5.92 and 5.93 of the December consultation and has not changed its view. Ofcom has explained that it will monitor the issue of pass-through closely. It does not accept Orange's arguments that it does not have the power to address the issue via ex-ante regulation if deemed necessary, nor does it accept that its policy to address the issue via ex-ante regulation if necessary amounts to regulation "by the back door" and lacks transparency. The setting of ex ante regulation is subject to rigorous consultation requirements and legal tests, as set out in the Act.

5.19 The specific mechanisms of the charge control set out in Chapter 6 of this document take account of the concerns raised by industry that pass-through might not be achievable without both sufficient notice for MNOs to adjust and advise third parties of termination charges, and a sufficient period for FNOs to adjust retail rates to reflect the new charges.

5.20 As discussed in Chapter 6 of this statement, the implementation date for the charge control takes account of both concerns, to help ensure that pass-through can take place as quickly as possible after implementation of the further reductions in the price of termination.

“Issues concerning ex-post powers”

5.21 In its response to the December consultation, T-Mobile (Part II, paragraph 36) appears to be arguing that Ofcom has not satisfied section 88(1)(b)(ii) of the Act, concerning the promotion of sustainable competition.

5.22 T-Mobile argues that the behaviour addressed by the ex ante regulation should be considered by general competition [ex post] powers. In raising this point, T-Mobile refers in particular to anti-competitive price discrimination as the behaviour being addressed by the proposed ex ante regulation:

“36. Oftel’s analysis seems to be based on the general proposition that the lower the level of termination charges, the smaller the scope for anti-competitive price discrimination. However, ex ante regulation should not be put forward to deal with behaviour that should properly be considered under general competition law. Oftel’s own analysis supports the need to consider such behaviour under competition law taking into account the facts of the case rather than applying a blanket prohibition.” (T-Mobile, Part II, paragraph 36)

Ofcom’s response

5.23 Ofcom does not agree with T-Mobile’s argument. The underlying problem addressed by the ex ante charge control regulation proposed in the December consultation is the detrimental effects arising from SMP – pricing freedom leading to excessive charges. Ofcom considers that the increased risk of anti-competitive behaviour is an example of other concerns associated with pricing freedom. This is explained in paragraph 4.54 of the December consultation:

“…the Director puts forward this example as an illustration of competition problems that could arise when termination charges are set excessively.”

5.24 Ofcom does not accept T-Mobile’s argument that ex ante regulation is an inappropriate mechanism to address excessive pricing and anti-competitive price discrimination. Annex N of the December consultation set out a general analysis of why ex ante regulation might be appropriate in certain markets rather than rely solely on ex post competition law.

5.25 Ofcom’s view continues to be that reliance on general competition law is not a sufficient remedy in the circumstances of the mobile termination markets analysed in this market review. Ofcom considers that ex ante obligations provide greater certainty in the relevant markets, are aimed to promote competition and reduce the likelihood of an impairment to fair and effective competition. This issue was discussed in relation to the non-discrimination obligation and potential effects on anti-competitive price discrimination, in the December consultation (paragraph 5.41).

Ofcom conclusion on the charge control

5.26 Ofcom concludes that a charge control is an appropriate remedy for the provision of wholesale 2G mobile voice call termination on the networks of the four MNOs. The reasons for this are set out in chapter 5 of the December consultation (in particular paragraphs 5.59 – 5.106 and 5.154 – 5.161) and Chapter 4 and Chapter 6 of this statement.

Regulation of 3G voice call termination

5.27 The December consultation proposed no ex ante regulation of 3G voice call termination services.

5.28 At the time of writing, there is still only one MNO ('3') offering voice call termination over a 3G network. Vodafone and T-Mobile have so far restricted 3G services to data, whilst Orange and O2 have yet to offer 3G services.

5.29 The reported number of subscribers to '3''s services – and thus the total number of subscribers using 3G voice services - in the UK by the end of March 2004 was in the region of between 384,300[19] and 420,000[20] . This amounts to approximately 0.75% of the total mobile subscribers in the UK.

5.30 At such an early stage of roll-out, the costs of 3G voice call termination are unclear, and robust cost information is difficult to ascertain. Thus, in terms of the charges set for 3G voice call termination, there is currently insufficient evidence to conclude that such charges are excessive.

5.31 Ofcom also considers that any adverse effects to consumers associated with charges for 3G voice call termination are likely to be small, given the very limited size of '3''s mobile subscriber base relative to the wider mobile sector. In Ofcom's view, the lack of evidence of excessive charging, combined with the modest effect any charges have on consumers as a whole, mean that it would be disproportionate to impose ex ante obligations on 3G voice call termination at this time. Ofcom does, however, intend to keep this position under review, and will retain the ability to bring forward proposals for regulation if warranted.

5.32 Ofcom therefore remains of the view that no specific ex ante regulation of 3G voice call termination services is at present required.

Views of INTUG (cross-subsidy)

5.33 In response to this proposal, INTUG submits that 3G networks are able to offer voice transmission at much lower costs than 2G, whilst 3G network operators have a stronger incentive than 2G operators to set high termination charges, given the

"..greater scope for cross-subsidies to yet more expensive handsets and a much wider range of new services, in addition to the costs of network construction." (INTUG response, page 3)

Ofcom's response

5.34 It is Ofcom's view that INTUG's arguments about potential cross-subsidy do not provide sufficient justification to support the ex ante regulation of 3G voice call termination charges. As with all SMP conditions, the evidentiary thresholds for setting charge controls are high. In the case of 3G voice call termination, there is insufficient evidence to justify imposing a charge control. For the reasoning

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[19] As reported by *3G Mobile*, 26 May 2004

[20] As reported by *Mobile Communications*, 1 May 2004

in paragraph 5.111 of the December consultation and as explained in paragraphs 5.27-5.31 above, Ofcom does not consider that charge control regulation is appropriate for calls to 3G networks.

Views of INTUG (MNP)

5.35 INTUG also argues that as 3G customers move from 2G but retain their phone numbers by means of Mobile Number Portability ('MNP'), the possibility of high[er] termination rates would confuse callers to these handsets.

Ofcom's response

5.36 Ofcom considers that the concerns raised by INTUG are addressed by the current arrangements for number portability. Current industry arrangements are for termination of a call to a ported number to take place via the donor operator, where the terminating operator receives a charge set by the donor operator (this arrangement is discussed in Annex J of the December consultation and paragraphs 6.46-6.49 of Chapter 6 in this statement).

Views of INTUG (no ex ante regulation of 3G)

5.37 In page 4 of its response, INTUG suggests that Ofcom's decision not to impose ex ante regulation on 3G voice call termination is not correct, but does not advance any evidence to support this. INTUG also appears to suggest that Ofcom's decision not to regulate 3G would affect trade between member states and the development of a single market, but this proposition is not developed.

Views of BT

5.38 BT appears to believe that Ofcom has identified similar concerns in relation to 2G and 3G wholesale mobile voice call termination, but does not propose similar regulation of 3G as it does for 2G. BT argues that the regulation proposed for 2G mobile voice call termination should equally be applied to 3G voice call termination on mobile networks. BT also appears to suggest that since 2G is the predominant means of terminating mobile voice calls, 2G costs could be used as the basis for setting 3G termination charges (BT, paragraphs C1-C2).

Ofcom's response

5.39 BT's argument does not characterise Ofcom's position correctly. As discussed in paragraphs 5.27-5.31 above, Ofcom does not believe that ex ante regulation of 3G voice call termination is appropriate at present.

Views of European Commission

5.40 Pursuant to Article 7(3) of the Framework Directive, the European Commission provided comments on the draft measures notified by Ofcom in the December consultation.

5.41 In its response, the European Commission includes comments on the appropriateness of the proposals for 3G voice call termination (European Commission, Section III). In particular, the European Commission advises that

"…although 3G retail services might constitute a newly emerging market,…,termination of voice calls on 3G networks is not as such to be considered as a novel service or a newly emerging market."

5.42 The European Commission is of the view that absent ex ante transparency obligations in relation to 3G termination, MNOs could bypass the proposed regulation of 2G termination. The European Commission suggests that it

*"…**might** be appropriate for Ofcom to impose…transparency obligations… regarding 3G termination, allowing Ofcom to monitor and to determine whether the assumptions as to the constraining effect of 2G termination pricing on 3G termination are borne out." (emphasis added).*

Ofcom's response

5.43 Ofcom's view (as discussed in paragraphs 5.27-5.32 above) is that there is insufficient justification for ex ante regulation of 3G voice call termination at present. Ofcom has, however, taken utmost account of the European Commission's comments there is a case for monitoring 3G voice call termination charges. Ofcom does not, however, consider it necessary to impose specific ex ante regulation in relation to 3G voice call termination in order to achieve the requisite level of transparency.

5.44 As explained above in paragraph 5.29, '3' is so far the only MNO to launch 3G voice services. The proposal for regulating '3' set out in the December consultation was for a transparency obligation requiring '3' to provide advance notification of changes to charges for 2G voice call termination, along with a requirement to submit quarterly data to Ofcom concerning 2G and 3G call volumes. The obligations set out in this statement include a requirement on '3' to submit information to Ofcom on 2G call volumes and on total call volumes, and also to notify changes in charges for termination. In Ofcom's view, this obligation should be sufficient to allow continued monitoring of '3''s behaviour in relation to call termination volumes and charges.

Conclusion on the ex ante regulation of 3G voice call termination

5.45 As explained in paragraphs 5.27-5.32, Ofcom does not believe that specific ex ante regulation of 3G voice call termination is appropriate.

5.46 For the reasons discussed in paragraph 5.44 above, Ofcom is of the view that the proposals set out in the December consultation concerning '3' (the only MNO currently offering 3G voice call termination) preclude the need for additional 3G-specific ex ante regulation of its services. The inclusion of additional SMP obligations would therefore be disproportionate. The issue of transparency is discussed in more detail below.

5.47 For the period covered by the market review, Ofcom thus considers its approach to the ex ante regulation of 3G voice call termination to be proportionate. However, whilst there are currently insufficient grounds to impose additional ex ante regulation, it is possible that during the period of the next formal review of mobile voice call termination markets, 3G voice call termination may establish itself to such an extent that Ofcom may need to reconsider its position. Subject to satisfying the relevant tests (such as section 47(2) of the Act), Ofcom retains the power to impose an SMP condition(s) to address concerns with 3G voice call termination charges at a point after the publication of this statement. In line with paragraph 5.113 of the December consultation, Ofcom's position will be kept under review.

Provision of network access

5.48 Ofcom received no new, material issues concerning network access in submissions issued in response to the December consultation.

5.49 For the reasons set out in paragraphs 5.30–5.36 and 5.138-5.145 of the December consultation, Ofcom concludes that a requirement to provide network access (i.e. for 2G voice call termination services) on reasonable request should be imposed on O2, Orange, T-Mobile and Vodafone. A minor change has been made to the drafting of this condition. Ofcom believes that this change improves the clarity of this condition.

No undue discrimination

5.50 In section 3.1 (pages 11-12) of its response, Orange highlights that the proposed condition provides that undue discrimination may be deemed to have been shown where the MNO concerned

"…unfairly favours to a material extent an activity carried on by it so as to place at a competitive disadvantage persons competing with [it]".

5.51 Orange argues that paragraph 5.43 of the December response effectively states that at the time of writing, a condition prohibiting undue discrimination was unnecessary, as the investigation concerning the relevant issue informing the decision on whether such a condition might be necessary had yet to be concluded.

Ofcom's response

5.52 Discrimination between an MNO's own businesses and FNOs (as referred to in paragraph 5.42 of the December consultation) has been referred to by Ofcom as one potential example of undue discrimination. However, it is not the type of potential undue discrimination of principal concern to Ofcom.

5.53 As set out in paragraphs 5.38-5.39 of the December consultation, several types of discrimination might occur, with discrimination between other MNOs being of the greatest concern (rather than between the MNO concerned and FNOs, as is suggested by Orange's response).

5.54 Whilst the proposed condition might appear to be concerned only with discrimination between the Dominant Provider and other operators, the condition is in fact wider. The condition also, for example, prevents discrimination by the Dominant Provider through setting higher charges for one MNO and lower charges for another. Such behaviour might, for example, target new entrants (as discussed in paragraphs 5.37 and 5.39 of the December consultation).

Conclusion on the prohibition of undue discrimination

5.55 As explained in paragraphs 5.1 to 5.13 of the December consultation, Ofcom has the discretion to set SMP conditions where appropriate. As discussed in paragraph 5.7 of the December consultation, the relevant conditions that might be considered include a no undue discrimination obligation.

5.56 Paragraph 5.41 of the December consultation explains that an obligation not to discriminate unduly would provide greater certainty in the relevant markets. As discussed above, such a condition would address the various potential forms of discrimination, including that of greatest concern to Ofcom, namely discrimination between other MNOs.

5.57 Further, in Ofcom's view, compliance with such a condition places no onerous requirement on MNOs.

5.58 For the reasons set out in this document, and in paragraphs 5.37-5.41 and 5.146-5.153, Ofcom has therefore concluded that an obligation on O2, Orange, T-Mobile and Vodafone not to discriminate unduly in the provision of network access (i.e. 2G voice call termination services) is appropriate.

5.59 However, Ofcom notes that to address the concerns raised by this particular review (discussed in paragraph 5.53 above), it is not necessary to include the second sections (MC 2.2 and MD 2.2) of the undue discrimination conditions proposed in the December consultation. Ofcom has therefore removed these sections from the final conditions. Ofcom intends to consult on non-discrimination guidelines later in 2004.

Transparency – requirement to notify charges (and call volumes)

5.60 In the December consultation, it was proposed that '3' should be subject to a transparency obligation. This obligation required '3' to provide 28 days' notice of changes to its call termination charges to both those with whom it has entered into an Access Contract and to Ofcom, and to provide Ofcom with details of 2G and 3G call volumes on a quarterly basis. As discussed above, Ofcom remains of the view that this obligation is appropriate. However, a minor change to the drafting of this condition has been made to clarify that these details should be provided by charging period (e.g. peak / evenings / weekends in line with '3''s current charging periods), and to refer to '2G' and 'all' call volumes rather than 2G and 3G call volumes.

5.61 In response to the December consultation's proposals for the regulation of '3', Orange raises three main arguments questioning the rationale behind the proposals.

Orange – '3''s charges excessive

5.62 Orange does not agree that there is insufficient evidence to suggest that '3' will set charges that could be considered excessive, stating:

> *'3''s termination rates are "substantially higher than the 2G cost estimates of the Director…[and] are also higher than the current rates of the other MNOs, whose rates the Director has consistently alleged to be excessive" (Orange, paragraph 3.7.2)*

Ofcom's response

5.63 As explained in paragraph 5.124 of the December consultation, where '3' is unable to provide voice call termination services using its own 3G network, it switches calls at the gateway MSC and thereafter uses the 2G radio network of O2 as part of a roaming agreement. As stated in paragraph 5.126, the expectation would be that the charges set by '3' for 2G termination would be, to a degree, above the industry norm. Ofcom also considers that '3' has strong incentives to use its own 3G network, in preference to the 2G network of O2. This is discussed below, in paragraphs 5.67-5.70.

5.64 As noted in the SMP analysis in chapter 3 of this statement, Ofcom considers that '3' is likely to have considerable pricing freedom in the setting of charges for 3G voice call termination. However, as explained in paragraph 5.130 of the December consultation and paragraphs 5.27-5.31 above, at such an early stage of roll-out, the costs to '3' in providing 3G voice call termination are still largely unknown and there is currently insufficient evidence to conclude with any certainty that charges set by '3' for voice call termination are excessive.

5.65 Ofcom notes that in light of any control to reduce the charges for the 2G termination provided by O2, Orange, T-Mobile and Vodafone, it would expect a consequent reduction in charges set by '3'. There should also be effects on '3''s termination charges associated with the migration of traffic, as discussed in paragraphs 5.66-5.69 below. The obligation imposed by '3' under this Statement will assist Ofcom in keeping these matters under review.

Orange – '3''s incentives to use 3G

5.66 Orange suggests that it is wrong to assume that '3' has strong incentives to use its own 3G network, and not another's 2G radio network, and questions how this assumption is relevant to the analysis of mobile voice call termination services (Orange, 3.7.2)

Ofcom's response

5.67 As stated in the December consultation and confirmed in paragraph 2.1 above, Ofcom's analysis of mobile voice call termination services considers the relevant markets as wholesale voice call termination on each MNO's network (or, where the MNO operates both 2G and 3G networks, across both networks), and that '3' has SMP in the market in which it supplies wholesale mobile termination services (see paragraph 3.21 above). '3''s incentive to use its own 3G network does not directly affect this analysis.

5.68 However, in considering the appropriate ex ante regulation then to be applied to '3', Ofcom has taken into account a number of factors, one of which when considering the regulation of '3''s 2G call termination is '3''s incentive to use its own network rather than using the spare capacity of a competitor's 2G network.

5.69 This is considered in paragraphs 5.129 and 5.132 of the December consultation. Ofcom still considers it entirely rational for '3' to use its own network to terminate calls whenever possible (indeed it would be irrational not to do so, as that could lead to a reduction in potential revenues and the under-utilisation of its network, whilst conversely increasing revenues generated by, and utilisation of, O2's network). On this basis, Ofcom believes that the proportion of calls terminated by '3' as 2G will reduce over time. This is one factor that has informed Ofcom's decision on the appropriate regulation to impose on '3''s 2G termination services.

Obligation on '3' insufficient to address concerns

5.70 The third point raised by Orange is that the fact that enforcing a LRIC obligation would place a significant burden on '3' to provide accurate and updated information (paragraph 5.132, December consultation) is not a reasonable justification for the decision to treat '3' in a different manner to other MNOs.

Ofcom's response

5.71 In terms of '3''s 2G voice call termination services, Ofcom believes that the expected decline in '3''s 2G traffic would mean a 2G-specific LRIC obligation would be disproportionate. As part of its voice termination, '3' combines 2G with 3G and unlike with 2G call termination, there is significant uncertainty concerning the costs associated with '3''s provision of voice call termination. Ofcom is still of the view that there would be a significant burden on '3' in meeting a LRIC obligation. However, this is not the sole basis against imposing such an obligation. A full explanation to Ofcom's position as regards the regulation of '3''s call termination is provided in paragraphs 5.129 – 5.132 of the December consultation.

5.72 Ofcom remains of the view that a transparency obligation including a reporting requirement is a proportionate obligation to impose on '3' at this stage, as explained in paragraphs 5.134 – 5.137 of the December consultation.

5.73 However, this does not prevent Ofcom from setting additional remedies at a later date if such action is justified and compliant with all relevant tests in the Act (see also paragraph 5.47 above).

5.74 For the reasons set out in paragraphs 5.171 to 5.178 of the December consultation Ofcom also remains of the view that an obligation to notify proposed changes to charges in advance should apply to O2, Orange, T-Mobile and Vodafone. Ofcom has amended this condition to provide that the four MNOs must give notice, no later than 28 days after the condition comes into force, of the charges which will be in effect on 1 September 2004 for 2G call termination. This has been included to give purchasers of call termination sufficient time to adjust their retail prices and assist with pass-through (as referred to in paragraphs 5.19-5.20 above).

5.75 In the December consultation (paragraphs 5.179 – 5.188), it was proposed that Inquam should be subject to a transparency obligation requiring it to provide 28 days' notice of changes to its call termination charges.

5.76 Ofcom received no new, material issues concerning this proposal in submissions issued in response to the December consultation and Ofcom remains of the view that Inquam should be subject to the proposed transparency obligation.

Transparency – requirement to publish Access Contracts

5.77 In the December consultation (paragraphs 5.162 – 5.170) it was proposed that the four MNOs should be subject to an obligation to publish Access Contracts. Ofcom received no responses concerning this proposal in the December consultation and remains of the view that, for the reasons set out in those paragraphs, the four MNOs should be subject to such an obligation. Ofcom has made a small amendment to this condition to change the obligation to publish the Access Contracts within 28 days, rather than one month of the Condition coming into force and to publish any amendments to its Access Contracts or new Contracts within 28 days rather than one month. Ofcom considers that this is consistent with its approach taken in the advance price notification condition.

Alternatives

5.78 In the May and December consultations, Ofcom considered carefully whether there were effective alternatives to direct regulation of mobile voice call termination charges which would adequately protect the interests of citizen-consumers by creating the necessary conditions to bring down termination charges to the competitive level. These were discussed in Annex D of the December consultation document. At the time, Ofcom concluded that none of the alternatives discussed could be expected to be effective in the immediate future.

5.79 No new evidence has been presented to Ofcom that causes it to alter this view, although it notes that two responses – from O2 and UKCTA – both promote further consideration of alternative solutions, whilst acknowledging that these do not currently offer suitable substitutes for the proposed ex ante regulation.

5.80 For example, in page 3 of its response, UKCTA states:

"..Ofcom should continue to consider other alternatives to price controls…However, we agree with Oftel's view…that no technological substitute is currently available"

5.81 Whilst O2 advises that it does:

"..not expect the Director General to abandon completely formal regulation…on the expectation that the implementation of one or more of the alternative solutions might have the desired effect." (O2, page 5)

5.82 In page 6 of its response, O2 anticipates that looking forward, Ofcom will work with industry as part of a de-regulatory approach, stating that

"…O2 does reasonably anticipate that Ofcom will take a more participative approach in order that, over time, the industry can be weaned off formal regulation which, as is widely acknowledged, is inferior to the discipline exerted by competitive forces." (O2, page 6)

5.83 O2 suggests that if supported by FNOs, MNOs and Ofcom, a call back service in particular might offer an avenue to move away from regulation.

5.84 Whilst Ofcom's view remains that no solution(s) is currently available as an alternative to the proposed ex ante regulation, Ofcom notes the views of both O2 and UKCTA that alternatives should continue to be pursued with a view to moving away from ex ante regulation.

5.85 As part of its regulatory principles[21], Ofcom aims to operate with a bias against intervention and seek the least intrusive regulatory mechanisms necessary.

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[21] First published in Ofcom's Foundation and Framework document, September 2003

Ofcom would welcome the development of alternatives to regulation, in particular if these can be developed to a point where charge controls can be removed. Ofcom looks forward to discussing proposals with the MNOs, FNOs and others. As part of the review of voice call termination for the period after March 2006, Ofcom will discuss with industry the full range of regulatory options available to it, including options for holding charges at the 2005/06 efficient level, and where possible, alternatives to charge control regulation.

Conclusions on remedies

5.86 Having considered responses to the December consultation, Ofcom has concluded that:

(a) O2, Orange, T-Mobile and Vodafone should be subject to charge controls for 2G voice call termination as set out in chapter 6 of this statement;

(b) O2, Orange, T-Mobile and Vodafone should be subject to an access obligation for 2G voice call termination;

(c) O2, Orange, T-Mobile and Vodafone should be subject to an obligation not to discriminate unduly in relation to 2G voice call termination;

(d) O2, Orange, T-Mobile and Vodafone should be subject to obligations to notify 2G voice call termination charges in advance and to publish Access Contracts;

(e) '3''s 2G voice call termination should not be subject to charge controls;

(f) '3' should be subject to a transparency obligation to notify charges for 2G voice call termination and notify 2G and total call volumes; and

(g) Inquam should be subject to a transparency obligation to notify charges for call termination in advance.

5.87 Currently, suitable alternative solutions to the ex ante regulation set out in the statement do not exist, but such alternatives should be considered as part of a move towards potential future de-regulation.

5.88 As considered for the purposes of each of the May (see Chapter 6) and December (see Chapter 5) consultations, and as further considered for the purpose of this statement, Ofcom has in setting these obligations, met all relevant obligations under the Act and new EU regulatory framework, and given full consideration to all relevant factors including responses to the December consultation and the recently published ERG common position on the approach to appropriate remedies in the new regulatory framework: http://www.erg.eu.int/doc/whatsnew/erg_0330rev1_remedies_common_position.pdf

Chapter 6

Charge controls for 2G mobile voice call termination

6.1 As set out in Chapter 5, consistent with the December consultation, Ofcom has reached the conclusion that, given the finding of SMP for each operator in the relevant market, direct controls (through a charge control) should be imposed on the charges for terminating mobile voice calls on the 2G mobile networks of Vodafone, O2, Orange and T-Mobile. This chapter sets out in more detail the proposed level and structure for these controls.

6.2 In order to impose a charge control it is necessary to identify:

(a) the 'efficient charge' level that these charges should be brought down to by the end of the control period; and

(b) how these charges should be brought down to the level of this efficient charge.

The efficient charge level

6.3 Ofcom's decision regarding regulatory remedies, including the charge control, reflects considerations of economic efficiency and the intention to maximise benefits to end-users. Ofcom refers to the level of wholesale termination charges which it believes best achieves these objectives as the 'efficient charge' level.

6.4 As proposed in the May and December consultations, Ofcom has set the target charge on the basis of long run incremental cost (LRIC) plus a mark-up for common costs, based on the equal proportionate mark-up (EPMU) approach, and a network externality surcharge.

LRIC

6.5 Ofcom is of the view that the most appropriate and economically efficient basis for regulatory charge controls is forward-looking LRIC. The LRIC of voice termination is the additional cost an MNO incurs to provide termination. This can also be seen as the cost that the firm would avoid if it decided not to provide voice termination, taking a long-run perspective. LRIC based charges correspond more closely to the charges that would prevail in an effectively competitive market than accounting-based measures of cost. It is a fundamental goal of price regulation to mimic the effects of a competitive market and this consideration underpins the use of LRIC. Further details and references regarding the use of LRIC in a regulatory context are provided in Annex C.

6.6 More generally, further details concerning the implementation of LRIC and the mark-up for common costs, as well as a discussion of the responses to the December consultation regarding the calculation of the LRIC+ efficient charge level can be found in Annex C.

Economic depreciation

6.7 As stated in Annex E of the May consultation and paragraph 6.7 of the December consultation, the depreciation approach selected by Ofcom for the LRIC model is economic depreciation (for further details of the conceptual underpinnings, see *Calls to mobile: economic depreciation*, September 2001[22]. For a discussion of the cost path over time using economic depreciation in the LRIC model for key assets, see *Additional Information Concerning Oftel's LRIC Model*, 12 February 2002[23]). This matches the cost of equipment to its actual and forecast usage over the long term. As a consequence, there is relatively little depreciation in years where utilisation is low and relatively high depreciation in years of full, or almost full, equipment utilisation. By contrast, the usual accounting method takes the actual price paid for equipment (or its replacement cost) and divides by the expected equipment life to reach a depreciation charge for the year (thus adopting a straight-line depreciation profile). The timing of cost recovery under economic depreciation varies from that under such accounting depreciation. Between 2001 and 2006 the use of economic depreciation results in a higher per minute cost of terminating calls whilst in years prior to 2001, economic depreciation would have resulted in lower costs compared to an equivalent calculation based on accounting straight-line depreciation.

EPMUs for recovery of common costs

6.8 Ofcom considers it appropriate for regulated services to contribute towards the recovery of relevant common costs through a mark-up in addition to LRIC to allow for full cost recovery. Ofcom believes that it is appropriate for these costs to be recovered by an EPMU. In the May and December consultations, it was considered whether the efficient charge level should be set in accordance with Ramsey principles, that is, whether the mark-up for the recovery of common costs should be set on the basis of demand conditions. In theory, Ramsey prices minimise the loss in economic efficiency introduced by the departure from marginal cost pricing due to the presence of common costs. However, Ofcom has concluded that the derivation of Ramsey prices, or more generally of welfare-optimal prices, raises complex conceptual and practical issues which do not allow for sufficiently reliable optimal prices to be estimated. Ofcom believes that EPMU achieves a more appropriate balance between practicality and efficiency than the Ramsey methodology. These issues are discussed in detail in Annex K of the December consultation and paragraphs 5.19-5.33 of Chapter 5 in the May consultation.

Responses to the December consultation

6.9 T-Mobile (paragraphs II.10-17 of its response) disagrees with a number of the reasons on the basis of which Ofcom has decided not to employ a Ramsey-methodology. The specific points raised by T-Mobile are summarised and listed below.

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[22] see http://www.ofcom.org.uk/static/archive/oftel/publications/mobile/depr0901.htm

[23] see http://www.ofcom.org.uk/static/archive/oftel/publications/mobile/ctm_2002/lric_more120202.pdf

(a) T-Mobile considers that Ofcom's argument that the retail market is imperfectly competitive is contradicted by the empirical evidence and by Ofcom's own conclusion in the review of the retail mobile market that this market is effectively competitive.

(b) T-Mobile considers that the MNOs' overall pricing structure is not Ramsey-based, but even if it was T-Mobile argues that it would still be welfare enhancing to set those prices that were being regulated on the basis of broad relative elasticities rather than to ignore significant differences in these elasticities completely.

(c) T-Mobile rejects Ofcom's claims that the MNOs' ability to price discriminate and offer multi-part tariffs enables them to recover common costs from infra-marginal subscribers and limits the required mark-up on termination. T-Mobile claims that if MNOs had this ability, they would be using it now.

(d) T-Mobile argues that there cannot be more practical difficulties in identifying an estimate of Ramsey-based termination charges than in estimating EPMU, since Ofcom's own consultant has developed a model that estimates Ramsey prices. It also adds that, given the large sums at stake in this regulation, there can be no justification for basing mark-ups on implied assumptions about the relative super-elasticities of termination and origination that are outside the range of the empirical estimates.

(e) T-Mobile contests Ofcom's reliance on the past performance of the mobile market to justify cutting rates. It also notes that since the 24 July 2003 cut in termination charges, there are indications that market growth is slowing down at a penetration rate significantly below that of some other European countries.

(f) T-Mobile suggests there are inconsistencies in Ofcom's justification for not setting Ramsey-based termination charges. T-Mobile claims that Ofcom rejects the models proposed by Vodafone, Orange, O2 and T-Mobile on the grounds that these are over-simplified, but then adopts EPMU, which is the most simplified approach of them all. Moreover, T-Mobile argues that Ofcom appears content to use the Ramsey models to help estimate the externality surcharge.

(g) T-Mobile argues that Ofcom does not calculate the EPMU for common costs correctly because it allocates administration and customer acquisition, retention and service (CARS) costs, which represent the vast bulk of the common costs, to retail services.

6.10 Ofcom has addressed the first of T-Mobile's points in paragraphs 4.38-4.44 and in K.9-K.15 of the December consultation. In summary, Ofcom does not consider that a finding of 'no SMP' in the retail access and outgoing calls market is equivalent to a finding that MNOs will fully pass-through all excess profits earned in termination markets, and therefore set Ramsey-based prices in the retail market. Ofcom therefore continues to believe that there is a strong risk that setting Ramsey-based termination charges would not maximise social welfare.

6.11 In response to point (b), as explained previously (see paragraphs 5.19-5.25 of the May consultation and K.34-K.35 of the December consultation), Ramsey-based prices are a set of prices for a group of services which maximise economic efficiency, given that the presence of common costs across these services does not allow the adoption of marginal cost pricing (since the firm(s) would not break even if it priced all services at marginal cost). Hence, Ramsey-based prices allow for the recovery of common costs across all the services to which they are common and are based on the relative demand conditions for all these services. If some services are excluded, along with their marginal costs, they would be assumed not to contribute to the recovery of these costs and this would generate upwardly biased estimates of the mark-ups for the services included in the model. Such a set of prices would, thus, be sub-optimal because of this error of omission and would not maximise welfare. Hence, even if the termination charge was set on the basis of the Ramsey principle by Ofcom, the overall set of mobile prices would be efficient only if MNOs set Ramsey-based prices for the remaining services. Ofcom is of the view that MNOs do not have the incentive to set Ramsey-based retail prices. The reasoning behind this view has been discussed in paragraphs 5.26-5.30 of the May consultation and K.9-K.15 of the December consultation.

6.12 Regarding the ability to price discriminate, Ofcom has previously suggested (see paragraphs K.18-K.20 of the December consultation) that linear prices are not the most efficient set of prices that could be achieved in the mobile markets. This claim is supported by economic theory and the fact that MNOs do employ multi-part tariffs. However, Ofcom has never maintained that perfect price discrimination is necessarily feasible (see Ofcom's analysis of the externality mark-up in Annex G of the December consultation), but simply that even if full price discrimination is not possible, non-linear pricing is. Simple linear Ramsey pricing models (submitted by or on behalf of the MNOs) fail to take this into account and raise questions as to the claimed efficiency properties of these models.

6.13 Ofcom has previously rejected the claim in point (d) and in so doing, exposed the conceptual and practical reasons why it considers that Ramsey pricing is not the appropriate methodology for setting termination charges. This discussion is set out in Annex K of the December consultation. Ofcom has also explained why it believes that EPMU is the appropriate methodology to be used in this case.

6.14 Regarding T-Mobile's claim that Ofcom has relied on the past performance of the mobile market, in the December consultation (paragraph K.46) Ofcom stated that

"evidence from the history of the mobile market does not support the claim that EPMU represents inappropriate regulation. Since 1998 termination charges (for Vodafone and O2) have been regulated on the basis of Fully Allocated Costs (plus an externality mark-up), which is very close to setting charges on LRIC plus EMPU, and the mobile market has thrived (i.e. penetration rate and level of usage have increased dramatically)".

6.15 However, Ofcom has never relied on past performance of the mobile market to calculate the target charge, and thus set the charge controls, but has based it on what Ofcom considers to be sound economic principles and careful estimates of costs in current conditions.

6.16 In response to point (f), Ofcom does not consider its reasoning is inconsistent. Ofcom has previously stated that it is not aware of any model of efficient pricing which it believes is sufficiently reliable to develop 'optimal' prices for fixed-to-mobile calls and mobile termination charges. The weaknesses of the currently available models primarily relate to deficiencies in capturing all relevant market features and the extensive informational requirements that underpin them, as well as in their sensitivity to changes in this information. This generates doubts on the reliability and robustness of the results derived from these models. In this context, Ofcom considers that EPMU, as a basis on which to recover common costs, strikes a reasonable balance between practicality and efficiency. Ofcom's views on this issue are presented in further detail in Annex K of the December consultation (see in particular paragraphs K.42-K.43). In relation to the calculation of the externality surcharge, Ofcom is aware of the difficulty of robust quantification. It has used the best information available, which includes the use of Ramsey-based models, to derive a range of estimates for the surcharge. But Ofcom continues to recognise that all of the models used have deficiencies, which it has taken into account in its interpretation of the estimates and in making its judgement of a reasonable surcharge.

6.17 T-Mobile's final point (g) has also been raised by T-Mobile in another part of its response and is dealt with in detail in paragraphs C.101-C.105 of this document.

6.18 Also in response to the December consultation, Vodafone (paragraph 1.58 of its response) claims that Ofcom's arguments (in paragraphs K.42-K.44 of the December consultation) for not relying on the elasticity estimates provided by the MNOs to set termination charges merely shows that there is a range of uncertainty around these estimates, and that this is not enough to maintain that EMPU is more efficient than the Ramsey methodology.

6.19 Ofcom has not maintained that the EPMU methodology is theoretically more efficient than Ramsey pricing principles. Ofcom considers that, given the limited size of the common costs and the difficulties of setting efficient mark-ups, the use of an EPMU for common costs and a mark-up for the un-internalised network externality achieves a more appropriate balance between practicality and efficiency than the Ramsey methodology. Annex K of the December consultation sets out further details of Ofcom's view on these issues.

Network externality surcharge

6.20 In the May and December consultations, Ofcom proposed that it would be appropriate to allow MNOs to add an additional mark-up on cost when setting charges for mobile termination services. This mark-up (or surcharge) was designed to ensure that MNOs account for the external benefits that callers to and from mobile telephones receive from the addition of new subscribers to the network, and the maintenance of existing subscribers on the network. An outline of the approach in the December consultation, responses to the December consultation, and Ofcom's comments and conclusions can be found in Annex D.

The structure of the charge controls

6.21 The previous section addressed how the level of the efficient charge should be derived. This section describes Ofcom's approach for reducing current termination charges to this level and the structure of the control, specifically:

- the control periods;
- the treatment of calls from fixed networks and off-net mobile-to-mobile calls;
- the calculation of compliance with the control;
- the treatment of ported numbers; and
- the treatment of combined 900/1800MHz vs 1800MHz operators.

The control periods

6.22 Ofcom considers that the charge control regime should last until 31 March 2006, as proposed in the May and December consultations. Ofcom does not currently believe it would be appropriate to extend the period of regulation past this date without undertaking a subsequent market review.

6.23 The December consultation proposed an implementation date of 1 April 2004. Taking into consideration the publication date of this document, it is appropriate to revise the implementation date for the charge control proposed.

6.24 In considering the appropriate date from which the charge control should apply, Ofcom notes that a major motivation for a reduction in termination charges is that consumers should benefit from lower retail prices for calls to mobiles. Ofcom therefore believes that it is desirable to ensure that changes in retail fixed-to-mobile prices, by BT and other fixed operators, can occur at approximately the same time as changes in mobile termination rates. This will allow consumers to benefit at the same time as mobile operators reduce their prices. An implementation date of 1 September 2004 allows a reasonable period of time to achieve this objective, since it gives mobile operators 28 days (consistent with the industry standard and previous regulation) to revise and notify BT and other operators of their new charges[24], and a further 2 months for BT to effect retail price changes.

6.25 The charge control will therefore apply to the two periods:

- 1 September 2004 to 31 March 2005; and
- 1 April 2005 to 31 March 2006 (2005/06).

Responses to the December consultation

6.26 In section 3.4.3 of its response, Orange states its surprise that, as in the charge control proposed in September 2001, the current proposals still consider a charge control period until March 2006 as appropriate, despite the duration of the control period having fallen from four to two years. Orange concludes that due consideration has not been given to the appropriate period over which the controls should apply and over which termination charges should be reduced to the efficient charge level.

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[24] Conditions MC6 and MD6 have been amended to require the mobile operators to notify wholesale purchasers of the mobile call termination charges that will be in effect on 1 September 2004 no later than 28 days after the condition comes into force.

6.27 Contrary to Orange's conclusion, Ofcom has given careful consideration to the appropriate period of the charge control. As stated in paragraph H.2 of the December consultation and reiterated in paragraph 6.23 above, Ofcom does not believe it would be appropriate to extend the period of regulation past 31 March 2006 without undertaking a subsequent market review. Ofcom considers it important to review the nature and extent of regulation in this market earlier rather than later and therefore believes that a longer charge control period would not be appropriate.

6.28 T-Mobile expresses its belief, in paragraphs II.82-II.84 of its response, that if it chooses, it should be able to comply with the charge control by making a single change to its tariffs at the start of each control period. However, given BT's requirement for two months' notice prior to price changes, T-Mobile argues that this is not possible since the relevant call volume data would not be available at the point at which T-Mobile would need to make its pricing decisions.

6.29 As discussed in paragraph 6.24 above, Ofcom has concluded an implementation date of 1 September 2004 is appropriate. This date provides sufficient time to ensure that T-Mobile's practical concerns are addressed.

Calls from fixed networks and off-net calls

6.30 As proposed in the May and December consultations, Ofcom has decided to impose two separate sets of controls:

(a) one on the charges for terminating voice calls from fixed phones on 2G networks; and

(b) one on the charges for terminating off-net mobile-to-mobile voice calls on 2G networks.

6.31 Ofcom has set the level of these two controls to be the same. The LRIC of termination does not differ depending on where the call originates. The efficient charge level, and in particular the network externality surcharge, has been set primarily by reference to termination of fixed-to-mobile calls, but this is also the appropriate level to act as a safeguard control for the termination of off-net mobile-to-mobile calls (see the discussion on bilateral agreement in Chapter 5 of the December consultation for further details).

6.32 As in the previous proposals, Ofcom has decided that the control on each MNO should be placed only on the weighted average of the current three time-of-day charges (day, evening, and weekend) as MNOs should be free to vary these charges provided the overall charge control is met.

Responses to the December consultation

6.33 Orange raises two arguments against the imposition of two controls in section 3.2.1 of its response:

- Two controls is "somewhat otiose" given the interaction with the condition prohibiting undue discrimination; and

- It is not practically possible for Orange to comply with both charge control conditions, as it does not separately record mobile voice termination services by reference to the originating network.

6.34 Orange correctly asserts that the December consultation proposal for two charge control conditions is to address the possibility of an MNO otherwise being able to set a higher than average charge for one category of operator and lower than average charge for another category, whilst still meeting an average charge required by a single charge control. This was explained in paragraph 6.23 of the December consultation. However, Ofcom does not accept Orange's argument that the imposition of two controls is "somewhat otiose". As discussed in paragraph 6.23 of the December consultation, fixed-to-mobile and off-net mobile-to-mobile charges need not be identical, but should not permit the loading of the majority of charges onto one type of call. The two separate charge controls provide the necessary specificity to ensure such loading is avoided. Ofcom therefore considers two separate sets of charge controls necessary.

6.35 In terms of an inability to meet two separate controls, as set out in paragraph 6.24 of the December consultation, consent for compliance with a charge control to change from traffic-specific to total traffic volumes would be expected to be given for the period requested where an MNO is unable to identify the origin of the calls it terminates on its network. This would avoid the potential problem identified by Orange.

Compliance with the control

6.36 As proposed in Chapter 7 of the May consultation and Chapter 6 of the December consultation, Ofcom has decided to place a charge control on the average of the charges levied by each of the four MNOs (i.e. daytime, evening and weekend charges) for terminating voice calls on their 2G networks, weighted by the relative call volumes in the previous year. This charge control will bring the weighted average charge down to the efficient charge level by 2005/06. Ofcom's charge controls require that, during each period of the control, the average charge set by the regulated MNO (the Average Interconnection Charge or 'AIC') does not exceed the charge with which the operator is required to comply (the Target Average Charge or 'TAC').

6.37 Annex I of the December consultation and Annex H of the May consultation contain proposals on the specific form of the calculation of weighted average charges. As operators set different termination charges for different times of the day or week, a weighting mechanism must be used to determine the AIC. Ofcom also proposed that the TAC for each operator should be weighted on a consistent basis with the AIC, rather than the TAC being unweighted as per the previous charge control. This weighting of the TAC is designed to prevent unintended changes in traffic mix from distorting the impact of the charge control.

6.38 An adjustment mechanism was also proposed to ensure that the TAC is not distorted by over- or under-shooting in the previous year.

6.39 In the December consultation the conditions MC3, MC4, MD3 and MD4 specified the TAC for the second period (T_2) in terms of the Controlling Percentage[25] ($\Delta RPI_1 - X_2$), the Adjusted Base Target Charge (B_2) and the

[25] The charge control uses a controlling percentage which is defined in terms of changes in RPI in the previous year. More precisely, the charge control years proposed in the December

Adjustment Percentage (A_2) for the second period, and the AIC (I_1) for the first period:

$$T_2 = B_2 \cdot (1 + \Delta RPI_1 - X_2), \qquad \text{where } B_2 = \frac{\sum_{i=1}^{3} p_1(i)v_1(i)}{(1 + A_2)}, \; A_2 = \frac{I_1 - T_1}{T_1},$$

and $p_1(i)$, $v_1(i)$ are the time of day charges in the first period and time of day volume shares in the first period[26], respectively.

6.40 Given the decision to set the TAC in the first period equal to the efficient charge level for 2005/06 (see paragraph 6.81 below), X_2 is effectively equal to ΔRPI_1 and the Controlling Percentage term is no longer required. Noting that the AIC is defined in terms of volume shares in the previous year, the remaining terms can be restated to give:

$$T_2 \;=\; \frac{\sum_{i=1}^{3} p_1(i)v_1(i)}{(1 + I_1 / T_1 - 1)} \;=\; T_1 \cdot \frac{\sum_{i=1}^{3} p_1(i)v_1(i)}{I_1} \;=\; T_1 \cdot W_2,$$

where $W_2 = \dfrac{\sum_{i=1}^{3} p_1(i)v_1(i)}{\sum_{i=1}^{3} p_1(i)v_0(i)}$.

6.41 As noted in paragraph 6.87 below, Ofcom believes that it is simplest to specify the TAC for the final period in relation to the target average charge in the first period. This can be achieved by setting T_2 equal to T_1 multiplied by a Weights Adjustment Factor[27] (W_2) to account for changes in time of day weights. As demonstrated above, this formulation is equivalent to that proposed in the December consultation with a control for the second period of RPI-RPI.

Responses to the December consultation

6.42 Vodafone and Orange both re-iterated their opposition to the proposed methodology:

The formula generates unjustifiable arbitrary gains / losses that cannot be objectively justified as being representative of a MNO's underlying costs. It is our understanding that the objective of the proposed price control is to drive a MNO's charges to the

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consultation run from April to March; the volume weights are taken from the volume shares in April to March of the previous year; and the change in RPI is the change in the latest available calendar year, January to December.

[26] Similarly, $v_0(i)$ are the time of day volume shares in the year before the first period.

[27] The charge control specified in this document has a shorter first period, lasting 7 months in duration. The charge control conditions therefore specify the Weights Adjustment Factor explicitly in terms the Average Revenue for the first period divided by the AIC for the first period of the charge control, consistent with the expression in paragraph 6.40.

regulator's estimate of its reasonably incurred costs. The proposed TAC formula undermines this objective (Orange, p.30)

Vodafone repeats its view that a change to the manner in which the price cap is implemented is unnecessary. The impact of Oftel's proposals will be to reward 'overshooting' of the price cap by adjusting upwards the TAC in the following year. (Vodafone, paragraph 1.61)

6.43 Ofcom has explored in some detail the benefits of the proposed methodology in the previous consultations. Ofcom rejects Orange's interpretation that it creates arbitrary or unjustifiable gains or losses – it is designed specifically to address the arbitrary gains and losses that occur under the approach incorporated in the previous control. Orange's response does not provide an explanation of how, in the absence of an adjustment to the TAC, the arbitrary gains or losses under the previous approach would be accounted for. Indeed, under Orange's favoured approach, an MNO may find it could comply with the TAC in a completely illusory way, i.e. not via price changes, but solely through a change in traffic profile. Alternatively, if the weights move in the opposite direction (towards the daytime), an (unadjusted) charge control will necessitate extremely large price reductions. Thus, Ofcom considers the objective of reducing charges to an efficient level would be met in a more appropriate manner under the proposed approach.

6.44 Ofcom does not accept Vodafone's view of the effects of the proposed operation of the TAC formula with regards to 'overshooting'. As noted in paragraph A6.29 of the Review of the Charge Control on Calls to Mobiles, published on 26 September 2001, the adjustment factor here is intended to ensure that the TAC this year is not distorted by under- or over-shooting last year, i.e. that the target is calculated as if there had been neither under- nor over-shoot (see the expression for the Weights Adjustment Factor in paragraph 6.40 above). The adjustment factor does not account for adjustments that should be made to the target in order to compensate (either) customers, for an overshoot in the prior year, or the regulated operator, for an undershoot.

6.45 Ofcom also does not accept that the treatment between an overshoot and overshoot are unreasonable (Vodafone, paragraph 1.62). Both overshooting and undershooting require Ofcom's intervention: in the first case a decision regarding the appropriate remedy for failure to comply with the charge control, and in the second to provide consent for recovery of an undershoot in the subsequent period. This reflects Ofcom's main objective to ensure that the charge control ceiling is not exceeded.

Treatment of ported numbers

6.46 Number portability is the facility which allows subscribers of publicly available telephone services (including mobile services) to change their service provider whilst keeping their existing telephone number. Its purpose is to foster consumer choice and effective competition by enabling subscribers to switch between providers without the costs and inconvenience of changing telephone number. Mobile number portability was introduced in the UK in January 1999. The current commercial arrangements and its implications are described in Annex E.

6.47 In the May consultation Ofcom expressed the view that the level of porting of mobile numbers has become significant enough to warrant proper consideration of how they should be treated in the charge controls (see paragraphs 7.33 and 7.34 of the May consultation). Having examined the issue further, Ofcom noted that including ported-in minutes and then allowing the MNOs to request their exclusion (as proposed in the May consultation) could result in an undesirable outcome. Thus in the December consultation Ofcom modified its proposal to address this concern and suggested excluding call minutes to ported-in numbers from the charge controls (see paragraphs 6.26 to 6.29 and Annex J of the December consultation). However, Ofcom also proposed that it would include these call minutes in the controls if a concern arose that the MNOs might be reducing the effectiveness of the charge controls by setting excessive termination charges for calls to ported-in numbers.

6.48 Ofcom has not changed its view and intends to implement the proposal put forward in the December consultation. Given the current charging arrangements, Ofcom considers its December proposal to be the most appropriate treatment of calls to ported numbers. Whilst call minutes to ported numbers are not going to be included in the charge controls, this does not prevent Ofcom including these minutes in the control if the MNOs are found to be manipulating the situation and setting excessive termination charges for calls to ported-in numbers.

6.49 Further details regarding ported numbers and the responses to the December consultation are discussed in Annex E.

The controls for the combined 900/1800MHz and the 1800MHz operators

6.50 Ofcom has considered whether there should be different target charges for each operator or whether they should all be subject to the same charge control. As proposed in paragraph 7.36 of the May consultation and paragraph 6.30 of the December consultation, Ofcom believes that the efficient charge level for combined 900/1800MHz and 1800MHz operators should be different and, thus, that the controls on these two types of operators should be set at different levels. However, Ofcom believes that Vodafone and O2 (the two combined 900/1800MHz operators) should have the same target charges as each other, as should the two 1800MHz operators (Orange and T-Mobile), since operators of the same operator-type face the same cost conditions.

6.51 As to the magnitude of the difference in efficient charge levels for different types of operators and the underlying reason for this, Ofcom's view has not changed from that stated in the May and December consultations, that at current traffic levels, neither operator type has a significant cost advantage over the other on an accounting basis (see paragraph 6.31 of the December consultation). Whilst a minor adjustment has been made regarding the inter-operator differential following amendments to the LRIC model output (see paragraph C.87) the net difference in efficient charge levels remains essentially unchanged from the December consultation and reflects the difference in LRIC derived from the use of economic depreciation to obtain the path of costs over time. A full discussion of these issues including responses to the December consultation is presented in paragraphs C.71-C.87 of Annex C.

6.52 Given the difference in efficient charge levels for the two types of operators, as stated in the May and December consultations, Ofcom believes that it is appropriate to set the target average charge in the first period as an absolute target in pence per minute to allow the charges of the four operators to be aligned. As explained in paragraph H.3 of the December consultation, this allows the target average charge for each type of operator to be set at the same amount above the efficient charge ensuring that the difference between the target average charges for the two types of operators equals the difference in the level of the efficient charge for each type of operator. Thus one type of operator would not have an advantage over the other which potentially might result in a distortion in retail competition. It also means that the same target average charge can be set for Orange and T-Mobile, reflecting the identical efficient costs that they incur as 1800MHz operators[28].

Summary

6.53 In summary, as discussed above, Ofcom has concluded that:

(a) the charge controls should apply until 31 March 2006 and operate over two periods: in both the first period (1 September 2004 to 31 March 2005) and the final period (1 April 2005 to 31 March 2006) the target average charge should be set as a specified figure[29];

(b) there should be two separate sets of controls for termination of fixed-to-mobile and off-net mobile-to-mobile calls;

(c) the weights in each charge control should be based on the volumes of minutes of the relevant traffic experienced by each MNO during the previous year;

(d) call minutes to ported-in mobile numbers should be excluded from the weights and therefore from the controls; and

(e) since the efficient charge levels for the combined 900/1800MHz and the 1800MHz operators are different, the controls on these two types of operators should be set at different levels.

The specific controls

6.54 This section describes the detailed specification of the charge controls and how it has been derived.

6.55 Tables 1 and 2 below summarise the target average charges for fixed-to-mobile 2G voice termination and off-net mobile-to-mobile 2G voice termination respectively. The target average charges for fixed-to-mobile voice termination are identical to those for off-net mobile-to-mobile voice termination.

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[28] Currently Orange and T-Mobile have different average charges.

[29] subject to changes in time of day weights for the final period target average charge (see paragraphs 6.36-6.41)

Table 1: Target average charge for 2G fixed-to-mobile voice termination

Pence per minute (nominal)	*900/1800MHz operators (Vodafone, O2)*	*1800MHz operators (Orange, T-Mobile)*
Charge in first period (1 Sep 04 - 31 Mar 05)	5.63	6.31
Charge in final period (2005/06)*	5.63	6.31

*subject to changes in time of day weights

Table 2: Target average charge for 2G off-net mobile-to-mobile voice termination

Pence per minute (nominal)	*900/1800MHz operators (Vodafone, O2)*	*1800MHz operators (Orange, T-Mobile)*
Charge in first period (1 Sep 04 - 31 Mar 05)	5.63	6.31
Charge in final period (2005/06)*	5.63	6.31

*subject to changes in time of day weights

6.56 The derivation of the efficient charge level and the appropriate target average charges in the two periods of the control is discussed below.

Derivation of the efficient charge

6.57 The efficient charge level for 2005/06 is composed of the LRIC for voice call termination plus a mark-up for common costs, based on the equal proportionate mark-up (EPMU) approach, and a further mark-up for the network externality.

6.58 The LRIC for voice call termination is calculated from a LRIC model developed by Oftel and published in April 2002[30] based on the costs of a reasonably efficient 2G mobile operator in the UK[31]. In its review of the charges for calls to mobiles, the CC agreed with the general principles underlying the model methodology and that the model is a suitable starting point for the assessment of costs (see paragraph 2.287 of the CC report and paragraphs C.4-C.6 of Annex C for further references).

6.59 In the light of further information made available during the CC inquiry of 2002 and responses to both the May and December consultations, Ofcom has considered a number of issues and potential adjustments to the output of the April 2002 model. These issues are discussed in detail in Annex F of the December consultation and subsequent responses are discussed in Annex C of this statement, which covers:

(a) Cost of capital;

[30] see http://www.ofcom.org.uk/static/archive/oftel/publications/mobile/ctm_2002/april02_model.zip

[31] An updated version incorporating the changes discussed in the December consultation and in Annex C will be available shortly on Ofcom's website.

(b) Amendments to the LRIC model output;

(c) Comparison with MNO data;

(d) Network common costs; and

(e) Non-network common costs.

6.60 Following responses to the December consultation, Ofcom has also revised its estimates of the level of the network externality surcharge as discussed in paragraphs 6.70-6.72 below.

Cost of capital

6.61 Ofcom takes the view that the appropriate cost of capital in the context of this market review is the cost of capital for a reasonably efficient 2G mobile operator in the UK. Ofcom has considered a number of methodologies in forming its view about the cost of capital, but believes that the main emphasis should be on the use of the Capital Asset Pricing Model (CAPM). Ofcom has undertaken a fresh analysis of each of the components of the CAPM used to derive an estimate for the cost of capital in the light of more recent information and after consideration of comments received in response to the December consultation. On this basis, Ofcom estimates the pre-tax real cost of capital to be in the range of 9.8% to 14% with a mid-point of 12%, which is a small decrease from the 12.25% that was proposed in the December consultation. All other factors remaining unchanged, this results in a small decrease in the economic cost of termination for 2005/06 of about 0.03ppm (in real 2000/01 terms), which is less than 1%. Further details of the derivation of this range and a discussion of responses to the December consultation are provided in Annex B.

Amendments to the LRIC model output

6.62 Ofcom is currently undertaking a review of the annual administration fees paid by MNOs for their 2G spectrum allocation which may result in revision to the fees from 2005/06. This has resulted in an amendment to the assumed input costs to the LRIC model regarding 2G spectrum pricing. Ofcom has made further amendments to the LRIC model where appropriate in order to address responses to the December consultation. The issues raised are discussed in detail in paragraphs C.7-C.22 of Annex C. In summary, Ofcom has amended the model calculation with reference to:

- administered incentive pricing for 2G spectrum; and
- the treatment of equipment that declines in quantity.

6.63 In paragraphs C.23-C.39 of Annex C, Ofcom also addresses comments regarding the lifetime of assets used in the model, the asset prices used in the model after 2010, and the impact of uncertainties in a dynamic market such as migration to 3G.

6.64 The overall impact of these amendments is an increase in the economic cost of termination in 2005/06 of about 0.06ppm (in real 2000/01 terms), or about 1.5%.

Comparison with MNO data

6.65 As stated in Annex E of the May consultation and Annex F of the December consultation, in order to address concerns over the accuracy of the LRIC model, Ofcom has undertaken a comparison between the outputs of the model and actual cost accounting data from the MNOs. Ofcom has derived adjustments to be applied to the output of the LRIC model following the methodology proposed by the CC in its inquiry.

6.66 As described in paragraphs C.41-C.93 of Annex C, Ofcom has given detailed consideration to the responses to the December consultation regarding the appropriateness of Ofcom's approach. In particular, Ofcom has considered the following issues:

- the appropriate level of gross book value (GBV) averaged across the four MNOs;
- the appropriate 'data adjustment' factor (given that the MNOs' submitted information reflects both voice and data services whilst the LRIC model considers a voice-only network);
- the varying proportions over time of capital and operating costs that contribute towards the total economic cost;
- the appropriateness of a reconciliation of the model results with the MNOs' cost information conducted at a total level vs at a termination-specific level;
- the comparability of coverage and quality between combined 900/1800MHz and 1800MHz operators in 2001 and subsequent investment;
- the magnitude of the differential in economic cost between combined 900/1800MHz and 1800MHz networks; and
- the appropriate basis of cost recovery (economic depreciation vs accounting depreciation).

6.67 In summary, as a result of the amendments made to the LRIC model output noted in paragraph 6.62 above, Ofcom finds that an upward adjustment of 38.7% should be applied to the capital costs and a downwards adjustment of 8.5% should be applied to the operating costs in the LRIC model, to reconcile the model's output with the actual costs incurred as reported by the MNOs. These percentage adjustments compare with a capital adjustment of +35.6% and operating adjustment of -14.9% considered in the December consultation (see paragraph 6.45 of the December consultation). Overall, the net adjustments to the LRIC model figures following comparison with the MNOs' data increase the results for the 2005/06 economic cost by 0.33ppm and 0.14ppm (in real 2000/01 terms) for combined 900/1800MHz and 1800MHz operators respectively. These adjustments are approximately 0.2ppm higher than the adjustments proposed in the December consultation.

Network common costs

6.68 Consistent with the approach described in paragraph 6.4 above, the LRIC model incorporates an EPMU for network common costs. Responses to the December consultation include concerns regarding the definition of the minimum coverage network common costs and the allocation of these common costs. These concerns are discussed in paragraphs C.96-C.100 of Annex C. Ofcom continues to believe that both the calculation of the magnitude of network common costs and their allocation is reasonable for the reasons set out in Annex C.

Non-network common costs

6.69 As in paragraph 7.48 of the May consultation and paragraph 6.48 of the December consultation, Ofcom has also included a common cost mark-up for the recovery of non-network administrative costs that should be recovered across all areas of the business, including both retail and network services. Responses to the December consultation stated the view that an unreasonable proportion of these costs were recovered from retail services since the retail activities category included all relevant cost elements, but the costs included in the network category were not similarly complete as the cost of capital tied up in the capital base was missing. Ofcom agrees that a better measure of the capital component of the network cost is the sum of network depreciation and the cost of capital associated with the network assets and, accordingly, has revised the non-network common cost mark-up to 0.41ppm (in real 2000/01 terms) from the figure of 0.33ppm proposed in the December consultation. Details of this calculation, discussion of other responses regarding non-network common costs, and Ofcom's view of these issues are provided in paragraphs C.101-C.116 of Annex C.

The economically efficient network externality surcharge

6.70 Ofcom considers it appropriate to add a further mark-up (an 'externality surcharge') to the LRIC of termination and EPMU for common cost recovery, which reflects the value of the network externality.

6.71 In both Annex F of the May consultation and Annex G of the December consultation, caution was expressed regarding the estimation of a surcharge, noting that the conceptual and practical estimation obstacles were formidable. A judgement was made on the basis of a range of estimates produced by different models of behaviour in wholesale and retail mobile markets. Each of these estimates provided a relevant, although incomplete, perspective on the efficient surcharge. Ofcom maintains a similar approach to the calculation of the appropriate surcharge in this Statement.

6.72 Ofcom considers that, broadly speaking, the estimates used in the previous consultations remain relevant to the decision about an appropriate externality surcharge. However, following responses to the December consultation, Ofcom has refined its methodology resulting in an upwards revision to two of these estimates. Ofcom therefore believes it would be appropriate to allow an additional 0.1ppm for the externality surcharge. This takes the appropriate surcharge to 0.5ppm. An outline of Ofcom's approach, responses to the December consultation, and Ofcom's view of the responses are discussed in Annex D.

Summary of the efficient charge

6.73 Taking account of the factors raised above, Ofcom has determined the efficient charge level for 2005/06 to be 5.00ppm and 5.60ppm (in real 2000/01 terms) for combined 900/1800MHz and 1800MHz operators respectively, as shown in the table below[32]. These figures are the target average charges for the final year of the control and are approximately 0.4ppm higher than those proposed in the December consultation.

Table 3: Efficient charge level (LRIC + common cost mark-up + network externality mark-up)

Pence per minute (real 2000/01)	***2001/02***	***2002/03***	***2003/04***	***2004/05***	***2005/06***
900/1800MHz operators					
LRIC+ mark-up for common costs	6.03	5.58	4.72	4.43	4.50
Network externality mark-up	0.50	0.50	0.50	0.50	0.50
Efficient charge	6.53	6.08	5.22	4.93	5.00
1800MHz operators					
LRIC+ mark-up for common costs	7.19	6.58	5.40	5.01	5.10
Network externality mark-up	0.50	0.50	0.50	0.50	0.50
Efficient charge	7.69	7.08	5.90	5.51	5.60

Path of reductions to the efficient charge

6.74 Having determined the level of the target charge in the final period (2005/06), the appropriate level of the target charge in the first period (1 September 2004 to 31 March 2005) must be determined, and the method for specifying the charge control for the final period (2005/06). Therefore this section considers:

- the starting charge;
- the level of the target average charge for the first period; and
- the method for specifying the control for 2005/06.

Starting charge

6.75 In order to assess how quickly termination rates should be reduced to the efficient charge level at the end of the control period (2005/06) it is relevant to establish the level of current termination rates. Ofcom's derivation of current termination charges is set out in paragraphs H.15-H.17 of the December

[32] The figures of 5.00ppm and 5.60ppm (in real 2000/01 terms) are equivalent to the nominal figures of 5.63ppm and 6.31ppm presented in Tables 1 and 2.

consultation and summarised in nominal and real 2000/01 terms in the table below.

Table 4: Starting charges in nominal and real 2000/01 terms

	900/1800MHz operators	*1800MHz operators*
Charge in 2003/04 (nominal ppm)	8.04	9.47
Charge in 2003/04 (real 2000/01 ppm)	7.53	8.88

Target average charge for first period

6.76 The purpose of the charge control is to set charges at the efficient level by the end of the control period. The control period lasts until 31 March 2006 and the methodology described above determines the efficient charge level for the period 2005/06 (1 April 2005 to 31 March 2006). The target average charge for the final period 2005/06 is therefore set to equal this efficient charge level. Given the implementation date for the charge control of 1 September 2004, it is necessary to determine the path of charge reductions to the efficient charge level by specifying the target average charge for the first period (1 September 2004 to 31 March 2005).

6.77 In determining the appropriate level of the target charge in the first period, Ofcom has given careful consideration to balancing two objectives:

- reductions should be achieved sufficiently quickly in order to deliver substantial benefits to consumers; and
- reductions should allow sufficient time for operators and customers to adjust to new levels and structures of mobile charges.

6.78 The first point seeks to ensure that consumers benefit through lower fixed-to-mobile call charges. The second point notes that benefits to callers to mobiles should not be at the expense of unacceptable disruption to the mobile sector, the industry and consumers more generally. In practice, any delays in implementing the charge control results in shifting the balance away from the first objective because consumers benefit less quickly from the price cuts.

6.79 In the May consultation the level of the target charge for 2004/05 was based on calculating the size of three equal real percentage reductions to take the starting charge down to the efficient charge level in 2005/06, and applying two such reductions to obtain the 2004/05 target charge. The December consultation followed the same approach but applied an additional adjustment to the 2004/05 target charge following the principle of maintaining a given balance between the two objectives above.

6.80 However, an implementation date of 1 September 2004 means that maintaining the same balance would result in setting a target charge for the first period below the efficient charge level. Ofcom believes that setting such a target charge would be unreasonable and have undesirable consequences. It follows that the lowest reasonable target charge that can be set will result in a reduced benefit to consumers in comparison to the previous proposals.

6.81 Ofcom has considered this issue carefully in light of representations in response to the December consultation. Consistent with the objectives in paragraph 6.77 above (and stated in previous consultations[33]), Ofcom has determined that it is appropriate for the charge control to move straight to the efficient charge in 2004/05, so that the target average charge in the first period is set at the efficient charge level for 2005/06.

6.82 Ofcom's objective is not only to deliver benefits to consumers sufficiently quickly but also to consider the potential effect of reductions in termination charges on operators, the industry and consumers more generally. Ofcom believes that the charge control allows sufficient time for preparation and adjustment, both in terms of financial planning and adjustment to retail prices. With regards to financial planning, Ofcom considers that the industry has been made sufficiently aware of regulatory intention in this area to plan for and accommodate changes in termination revenues since the publication of the market review in September 2001. With regards to adjustment to retail prices and the potential for associated disruption, Ofcom does not believe that a one-off reduction to the efficient charge level is likely to lead to excessive disruption or damaging consequences to mobile subscribers. The magnitude of the reduction is similar to the initial reduction proposed in the December consultation and not much greater than the compound effect of the CC's recommendation of two real reductions of 15% to occur in 2003/04.

6.83 From Table 3 above, it is apparent that the efficient charge level in 2004/05 is actually lower than the efficient charge in 2005/06. This is due to the revision in assumed 2G spectrum pricing from 2005/06 onwards as discussed in paragraphs C.12-C.16 of Annex C. However, Ofcom believes it would be undesirable to set a target average charge for the first period which is lower than the target average charge for the final period of 2005/06 as this would potentially have a disruptive effect on consumer prices. Therefore Ofcom has decided to set the target average charge for the first period equal to the efficient charge level in 2005/06.

6.84 Taking the efficient charges for 2005/06 of 5.00ppm and 5.60ppm in real 2000/01 terms results in nominal target average charges of 5.63ppm and 6.31ppm for combined 900/1800MHz and 1800MHz operators respectively after inflating using compounded RPI[34].

Specification of control for 2005/06

6.85 By setting the target average charge for the first period to be equal to the efficient charge level for 2005/06 as an absolute target in pence per minute, this ensures that the difference in target average charges for the two types of operators is equal to the difference in efficient charges. This meets the objective stated in paragraph 6.52 above.

[33] See paragraph 7.23 of the May consultation and paragraph H.5 of the December consultation.

[34] Assuming the value of RPI used for 2005/06 is the same as the value for 2004/05 (2.8%).

6.86 In the December consultation the charge control for the final period (2005/06) was specified as a RPI-X control to reflect the required reduction from the 2004/05 charges necessary to reach the efficient charge level for 2005/06.

6.87 Given that Ofcom has now set the target average charge for the first period at the efficient charge level for 2005/06, the RPI-X specification of the charge control for 2005/06 is no longer necessary. It is simplest to specify the target average charge for 2005/06 to be the same absolute target in pence per minute as specified for the first period (subject to changes in time of day weights)[35]: that is 5.63ppm for combined 900/1800MHz operators and 6.31ppm for 1800MHz operator.

Responses to the December consultation

Starting charge

6.88 In paragraph A.3 of its response, Vodafone argues that the incorrect value of RPI has been used in setting the starting charge. Whilst a pro-rata RPI adjustment was used to derive the RPI-15% reduction on 24 July 2003, Vodafone argues that if this rate persists through to 31 March 2004 then the full annual RPI should have been used and thus Vodafone has been under-recovering termination revenue for the period from 25 July 2003. Furthermore, Vodafone asserts in paragraphs A.8-A.9 of its response that this RPI error in deriving the appropriate starting charge is perpetuated in Table 3 of Annex H of the December consultation since an inconsistent value of RPI is then used to convert from nominal to real.

6.89 In the context of this market review, the relevant question is not how the reduction on 24 July 2003 was calculated but the *current* level of termination charges as these dictate the starting point for the charge control[36]. In any case, Ofcom has set the target average charge in both control periods with reference to the efficient charge level for 2005/06 and not in relation to the starting charge (see paragraphs 6.81 and 6.73 above).

6.90 With regards to Vodafone's second point, Ofcom notes that this is no longer relevant given that Ofcom has chosen to specify the charge control exclusively with reference to the efficient charge level for 2005/06[37].

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[35] See paragraphs 6.36-6.41

[36] Nevertheless, Ofcom does not accept that Vodafone has been under-recovering termination revenue since the use of a pro-rata RPI figure in setting the reduction on 24 July 2003 reflects the implementation of a one-off cut to take effect *before* 25 July 2003. The fact that this charge level has continued to be in effect in accordance with the Continuation Notices given to the four MNOs on 23 July 2003 did not affect the calculation of that one-off cut.

[37] Even if it was relevant, Ofcom does not agree that there is an error in the nominal to real conversion since the purpose of the calculation is to determine the current charges in real 2000/01 terms consistent with the start of the charge control – 1 April 2004 in the case of the December proposals, and not 24 July 2003.

Adjustment for delay and 'retrospection'

6.91 In its response, Vodafone (paragraphs 1.16-1.43) suggests that the adjustment to the target average charge in 2004/05 proposed in the December consultation (see paragraph 6.79 above) had the effect of setting "the regulated charge at a lower level than would otherwise be appropriate to offset customers' 'overpayments' in an earlier period". Vodafone suggests that the intention is to achieve a retrospective effect from a forward-looking control and believes this proposal is unlawful and unreasonable. Similarly, O2 (pages 4-5), Orange (section 3.4), and T-Mobile (paragraphs I.12-I.15) argue that the proposed charge control is 'retrospective' or 'backward-looking'.

6.92 The purpose of the charge control is to set charges at the efficient level by the end of the charge control period. Consequently it is necessary to determine the path of charge reductions over the course of the control period to reach this efficient charge level. The implementation date of the charge control affects the path of reductions to reach the efficient level. It is legitimate for Ofcom in considering that path to seek to balance the interests set out in paragraph 6.77 above. This is necessarily a forward-looking exercise, and as set out in paragraphs 5.7-5.11 of Chapter 5, Ofcom does not accept an argument that the resulting charge controls are retrospective and therefore does not accept that in setting such controls Ofcom is acting ultra vires.

Impact on MNOs

6.93 Vodafone claims that operators have "reaped no financial advantage" (paragraph 1.33 of its response) from higher termination rates because these higher rates have been competed away in the retail market. This view is shared by O2.

6.94 In section 3.4.3 of its response, Orange disagrees with the view expressed in paragraph H.9 of the December consultation that MNOs have had sufficient opportunity to anticipate the reduction in future termination revenues or to accommodate these changes in their financial planning. Orange believes that re-balancing of revenues between incoming and outgoing calls cannot take place before reductions in termination charges due to the competitive pressures in the retail market which result in any potential excesses from call termination being competed away.

6.95 Ofcom notes that the claim by Vodafone and O2 would hold only if the 'waterbed' effect is complete which Ofcom does not accept (see paragraph 4.34 of Chapter 4). But in any case, Ofcom's rationale for its choice of target charges arises from a concern regarding the impact of delay on callers to mobiles.

6.96 In response to Orange's point, Ofcom has not commented upon the precise date for implementing changes to mobile outgoing call prices. The magnitude and timing of any changes to (unregulated) mobile retail charges is for MNOs to decide. As already noted in paragraph 6.82 above, the magnitude of the reduction in termination rates to occur in 2004/05 is similar to that proposed in the December consultation. Ofcom believes that MNOs have had sufficient time to consider the impact of this reduction and determine how to set their retail charges appropriately.

Impact on consumers

6.97 Regarding the benefit to callers to mobiles, in paragraphs 1.38-1.52 of its response, Vodafone states that it is not possible that fixed customers would have seen a reduction in charges from 1 January 2004 given the necessary processes such as the time required to notify BT prior to pass-through of reductions.

6.98 Vodafone also adds that callers to mobiles would not see the full benefits of this adjustment due to the fact that BT is not required to fully pass-through reductions in termination rates to callers from fixed to mobile phones. Orange also raises its concern regarding pass-through obligations on BT in section 3.4.2 of its response.

6.99 In contrast, on page 4 of its response, UKCTA argues that whilst it agrees with the approach described in the December consultation, it nevertheless believes that the proposed compensation for delay does not provide adequate relief to other sectors of the economy which are paying inefficient subsidies to the mobile sector.

6.100 Whilst Ofcom acknowledges Vodafone's point that a reduction in mobile termination charges may not pass through to callers to mobiles instantaneously, this is not the key consideration for the purposes of calculating the adjustment for delay. Under the neutral assumption that the time required for reductions in termination rates to pass through to retail prices remains unchanged whether the implementation date for the charge control is 1 January 2004 or 1 April 2004, the key observation is that a three month delay in implementation of the charge control will translate into a three month period during which consumers are likely to pay higher prices for calls to mobiles. However, as stated in paragraph 6.24 above, Ofcom has now set an implementation date of 1 September 2004 to enable consumers to benefit at approximately the same time that mobile operators reduce their prices, taking account of the concerns raised by industry that pass-through might not be achievable without both sufficient notice for MNOs to adjust and advise third parties of termination charges, and a sufficient period for FNOs to adjust retail rates to reflect the new charges.

6.101 The concern raised by Vodafone and Orange regarding BT's requirement to pass through the reductions in termination rates to callers from fixed-to-mobile phones is addressed in paragraphs 5.16-5.20.

6.102 In response to UKCTA's concerns, Ofcom has given consideration to the interests of different parties in balancing the objectives noted in paragraph 6.77 above. The main focus of these objectives is the interests of consumers, however, Ofcom has also given due consideration to the impact of the charge control on operators, consistent with its duty in section 47(2) of the Act to set a proportionate charge control condition. In particular, given the constraints of setting a target charge which is no lower than the efficient charge level, and setting a reasonable implementation date taking account of practical considerations so that reductions in termination and retail prices can occur together, Ofcom believes that the charge control set out in this document strikes an appropriate balance. Whilst UKCTA expresses its concern that the charge control does not formally require MNOs to reduce their rates until just before 31 March 2005 (the end of the first period), if MNOs do not reduce their rates early in the first control period, given how much higher current charges are above the target charge, MNOs would have to set their charges significantly below the efficient charge level in order to comply with the target *average* charge for the period. Having regard to Ofcom's requirement that MNOs must notify interconnecting operators of their effective charges on 1 September 2004 within 28 days of when the conditions come into force (see conditions MC6 and MD6), Ofcom's expectation is that MNOs are likely to implement charge reductions at, or close to, the beginning of the first control period.

Detailed calculation of adjustment for delay

6.103 With regards to the detailed calculation of the adjustment for delay, Vodafone submits in paragraph A.10 of its response that the effect of differential volumes between 2003/04 and 2004/05 should be taken into account. Vodafone also states its belief that it is more appropriate to calculate Table 3 in Annex H of the December consultation entirely in nominal terms rather than undertaking translations between nominal and real rates.

6.104 These concerns are no longer relevant to the charge control specified in this document since Ofcom's decision to set the target average charge in the first period at the efficient charge level no longer involves the calculation of an adjustment for delay[38].

Cost benefit analysis of regulation

6.105 Ofcom's approach is that regulatory intervention is to be considered appropriate only when there is a reasonable expectation that its benefits will exceed its costs. In paragraphs 7.58-7.63 of the May consultation and Annex L of the December consultation, an assessment of the net benefits to be gained from the regulation of termination charges was provided. Ofcom is continuing to use the same approach – the figures below are an updated version given the changes in LRIC noted above.

6.106 As noted in previous consultations, models of economically efficient pricing are in principle well suited to deriving estimates of the welfare gains from regulation. Ofcom's reservations about the relevance and practicality of deriving Ramsey prices means that such estimates should not be regarded as precise, and consequently Ofcom does not use these models to derive 'optimal' prices for fixed-to-mobile calls or mobile termination. Rather, Ofcom uses these models to provide an indication of the direction and broad magnitude of the effect of regulation.

6.107 The approach to the assessment of the appropriate level of voice termination charges involves an estimation of the set of charges that maximises the welfare of consumers, subject to ensuring that MNOs are able to earn a reasonable return on their investment. This assessment takes account of the benefits to all

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[38] Nevertheless, Ofcom notes that Vodafone's first concern was commented upon in footnote 81 of paragraph H.22 of the December consultation, and with regards to Vodafone's second concern, the approach taken and consulted upon in the May and December consultations considered a target charge for 2004/05 based on applying two of three equal *real* percentage reductions: performing the same calculation based on *nominal* percentage reductions does not necessarily generate the same result.

users, including those calling mobiles as well as the mobile customers themselves.

6.108 In particular, the assessment undertaken involves a comparison between two scenarios:

- a scenario in which termination charges are brought down via the charge control to the efficient charge and where other mobile prices are assumed to be set on a Ramsey basis ('constrained Ramsey'); and

- an unregulated scenario in which MNOs set excessive termination charges, but are assumed to make no supernormal profits overall (i.e. make sufficient revenues to cover costs, including the cost of capital, for retail and wholesale mobile services in total) ('zero-profit unregulated').

6.109 The comparison uses the relevant versions of the model produced by Dr Rohlfs and described in his paper *A model of prices* and *costs of mobile network operators,* 22 May 2002[39]. Dr Rohlfs' model is based on four services: mobile subscription, mobile-originated usage other than off-net, fixed-to-mobile usage and off-net mobile-to-mobile usage.

6.110 The comparison indicates that there are likely to be large gains from regulation. This is due to the highly inefficient structure of charges under the 'unregulated' scenario. That is, compared to taking an approach purely based on efficiency considerations, fixed-to-mobile and off-net mobile-to-mobile charges are priced considerably higher; and mobile-originated calls and subscription are priced considerably lower, than would be appropriate.

6.111 A summary of the results is as follows. The expected welfare gain of £222.5m is the per-quarter gain in 2005/06 (expressed in 2000/01 real terms). This is shown in Table 5 below. Expressed in current (2004/05) terms, the total benefit delivered over the course of the charge control is £1,449m. This has been calculated in line with the methodology used in the December consultation (see Table 3, Annex L).

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[39] See http://www.ofcom.org.uk/static/archive/oftel/publications/mobile/ctm_2002/main_report.pdf

Table 5: Summary of outputs of cost-benefit analysis (real 2000/01 terms)

		"Unregulated" scenario	*"Constrained Ramsey" scenario*
Subscription price		£16.66	£16.02
Mobile-originated usage price		5.1ppm	9.3ppm
Fixed-to-mobile usage price		26.5ppm	7.1ppm
Off-net mobile-to-mobile price		17.2ppm	14.7ppm
Mobile termination charge		24.8ppm	5.3ppm
Compared to calibration prices and quantities	*Change in consumer surplus (per quarter)*	£.332.8m	£555.3m
	Change in producer surplus (per quarter)	-£495.8m	-£495.8m
	Change in total surplus (per quarter)	-£163.0m	£59.5m
Welfare gain from regulation (per quarter)		£222.5m	

Responses to the December consultation

6.112 Vodafone, Orange and T-Mobile all comment on the reasonableness of the 'unregulated' termination charge, as used in Ofcom's comparison, and state that if a lower charge is used, the welfare gains would not be sufficient to justify a price control.

…the true gain (based on Frontier Economics' model, and the inputs proposed by the CC) is only £4.7 million per quarter…if one moves from 10.5ppm to the supposed optimal charge; and the true gain is only £63 million per quarter if one moves from 17ppm to the supposed optimal charge. (Vodafone, 1.59)

The base case unregulated scenario is fundamentally flawed and consequently the Director's reliance on the welfare analysis to justify the proposed price control obligation is without substance…due to (this deficiency) and the failure of the cost-benefit analysis to consider the dynamic effects of proposed regulation, the case for intervention is marginal at best. (Orange, p.7)

The Director's welfare model can also be fairly criticised because it is predicated on a Ramsey pricing structure in the retail and wholesale mobile markets. Given the Director's conclusions in respect of applying Ramsey pricing in his 'fair charge' calculations, the use of a Ramsey model can hardly be considered to be reflective of the Director's view of the "prevailing characteristics of the retail and wholesale mobile markets" (Orange, p.7)

6.113 The reasonableness of the unregulated charge is discussed in paragraphs 4.3-4.18 of this document. While Ofcom believes that the monopoly charge is likely to be in the range of 20-25ppm, the result of substantial welfare gains is robust to any plausible termination charge. As noted in paragraph 4.16, Vodafone has previously indicated that charges in the absence of regulation would be likely to be as high as 17-20ppm. If the unregulated charge were at this level, regulation would continue to provide substantial welfare gains as illustrated by Vodafone's own figure of £63m per quarter. There are also gains from regulation at lower termination charges (including reducing current termination charges); however, Ofcom does not consider such charges to be plausible, for the reasons expressed in paragraphs 4.3-4.18.

6.114 As to the reference to 'dynamic effects' of the proposed regulation, Ofcom has commented at paragraph 4.29 that it does not believe that substantive detrimental impact on dynamic efficiency is likely. This issue is further addressed in paragraphs L.19-L.23 of the December consultation, including a discussion of the effect of regulation on incentives to invest.

6.115 Orange makes a further point about the use of a scenario which uses a Ramsey pricing outcome. Ofcom believes this point is substantively addressed in paragraphs L.25-L.26 of the December consultation. To summarise, the Ramsey pricing model is not the only model of price-setting behaviour that could be assumed in the 'regulated' scenario. However, it is not critical to the size of the gains from regulation whether this model is used or not. Efficiency gains in welfare models are driven by either or both of two effects: (i) a general move of prices closer to cost (involving reductions in excess profit); and / or (ii) a closer alignment of specific prices to cost. Ofcom's welfare analysis compares two scenarios which are, by definition, zero-profit outcomes. This means that the first of the effects identified is not included in this case. Rather, the efficiency gains from regulation are driven solely by the second of these effects – in particular, by reducing the welfare losses associated with an excessive termination charge. That is, the critical driver of the gains from regulation is the size of the 'unregulated' price of termination. The structure of the other prices (set in the retail market for access and outgoing calls) is largely inconsequential to the result of welfare gains. Hence, once the termination charge is assumed fixed by regulation, it makes relatively little difference whether a Ramsey model, or another model of retail competition, is used.

6.116 T-Mobile makes a number of further claims about the welfare analysis. In particular it claims that the cost benefit analysis is "propped up" by an assumption of imperfect competition and excess profits, that Ofcom "effectively rejects" its own welfare analysis, and that the effect of price controls on subscriber numbers (in particular, pre-pay subscribers) predicted by the cost-benefit analysis is "inconsistent with both economic theory and the available evidence". (T-Mobile, paragraphs II.24-II.28 and II.32-II.34)

6.117 Ofcom believes that these claims are either inaccurate or that they have been addressed satisfactorily in previous consultations:

- the estimate of welfare gains from regulation in no way relies on an assumption of excess profits or of imperfect competition. As noted above, no profits are earned in total under either the regulated or unregulated scenarios in Ofcom's analysis. This point was addressed in paragraph L.34 of the December consultation.

- Paragraph L.29 of the December consultation addresses why weaknesses in welfare models means that they are inappropriate for setting regulated charges. T-Mobile's further points about the welfare costs of choosing an under- vs an over-estimate of the optimal mark-up are discussed in paragraphs K.44-K.45 of the December consultation.

- Paragraphs L.16-L.18 of the December consultation address the effect of price controls on pre-pay subscribers. In summary, the welfare model used makes a number of simplifying assumptions (e.g. that all subscribers pay the same price for subscription), in part due to the complexity associated with modelling existing retail tariffs. However, the model's result that it would be more efficient for the average subscription charge to rise from existing levels does not mean that charges to all subscribers must rise equally. The model does not capture price discrimination, and T-Mobile's claim that ongoing subscription charges for pre-pay users will have to be introduced to recover costs does not follow.

- T-Mobile further claims that the treatment of pre-pay subscribers is unreasonable, in that Oftel had effectively assumed that low value subscribers had a perfectly inelastic demand. However, the point initially made in the December consultation was that pre-pay subscribers incur depreciation costs in holding a handset. These ongoing costs form part of the subscription cost, from the point of view of the pre-pay subscriber. Therefore, it is not correct to say that these users currently pay no 'ongoing' charge (as modelled), and that even if (ongoing or upfront) charges to these users were to rise, it is not plausible to suggest that there would a "massive fall" in the number of pre-pay subscribers, as claimed by T-Mobile (p.93 of its response to the May consultation). The assumed elasticity of demand for subscription (-0.3) provides a reasonable estimate of the effect on subscriber numbers from a price increase. Ofcom therefore believes the treatment of pre-pay subscribers in the welfare model is reasonable.

Conclusion on the cost-benefit analysis

6.118 Ofcom considers that the cost-benefit analysis shows that consumers will, on the whole, be made substantially better off by the regulation of mobile termination charges.

Chapter 7

Discontinuing existing regulation

Introduction

7.1 The publication of this Statement brings to a conclusion Ofcom's review of the markets for mobile voice call termination.

7.2 The new Directives allow Member States to carry forward some existing regulation until the market reviews have been completed, in order to avoid a regulatory gap. The power for Ofcom to do this (previously exercised by the Director) is contained in paragraphs 9 and 22 of Schedule 18 to the Communications Act 2003 (the 'Act'). Those provisions allow Ofcom to issue continuation notices to Communications Providers carrying forward conditions previously contained in telecommunications licences, and also interconnection directions made under the Telecommunications (Interconnection) Regulations 1997.

7.3 As detailed below, the Director issued such continuation notices to relevant Communications Providers, including the four MNOs, in July 2003. Now that the mobile call termination review has been completed, Ofcom is under a duty to discontinue continued conditions and directions which are relevant to this Review, in accordance with the requirements of the Act.

Continued regulation

7.4 Specified licence conditions were made to continue in force by a continuation notice given to the four MNOs on 23 July 2003. An interconnection direction relating to a dispute over Vodafone's credit vetting clause made on 16 July 2003 (the "Interconnection Direction") was made to continue in force by a continuation notice given to Vodafone Limited, ntl Limited ("ntl") and MCI Worldcom Limited ("MCI") on 21 July 2003. These continuation notices (referred from now on as the "Continuation Notices") are available as follows-

- O2:

  http://www.ofcom.org.uk/static/archive/oftel/publications/eu_directives/cont_notices/o2.pdf

- Orange:

  http://www.ofcom.org.uk/static/archive/oftel/publications/eu_directives/cont_notices/orange.pdf

- T-Mobile:

  http://www.ofcom.org.uk/static/archive/oftel/publications/eu_directives/cont_notices/tmobile.pdf

- Vodafone:

  http://www.ofcom.org.uk/static/archive/oftel/publications/eu_directives/cont_notices/vodafone.pdf

- Vodafone, ntl and MCI

  http://www.ofcom.org.uk/static/archive/oftel/publications/eu_directives/cont_notices/interconnection/notice_55.pdf

7.5 The Continuation Notices came into effect on 25 July 2003. Further details are contained in the Director's consultation document (http://www.ofcom.org.uk/static/archive/oftel/publications/licensing/2003/cont0703.htm) and statement (http://www.ofcom.org.uk/static/archive/oftel/publications/eu_directives/cont_notices/cont0903.pdf) on the continuation process. In that statement the Director set out his intentions with regard to the process for discontinuing regulation. He set out that he would discontinue provisions deemed relevant to a particular market for the purposes only of that market as the each market review was completed.

Next steps

7.6 Paragraph 9 (11) of Schedule 18 to the Act imposes a duty on Ofcom, as soon as reasonably practicable after giving a continuation notice, to take the necessary steps to enable it to decide whether or not to set a condition (including a SMP condition) for the purpose of replacing the continued condition, and to decide whether or not to exercise its power to set such a condition for that purpose. Similar duties apply in respect of interconnection directions under paragraph 22(9) of Schedule 18 to the Act. In relation to mobile call termination, this has entailed carrying out a market review of the relevant markets to identify relevant markets, to determine whether any person has SMP in those markets and to decide whether or not to set SMP conditions for the purpose of replacing the relevant continued provisions.

7.7 When Ofcom has made the decision required by paragraph 9(11), paragraph 9 (12) of Schedule 18 to the Act requires Ofcom to give a notice (a discontinuation notice) that the continuation notice ceases to have effect as soon as reasonably practicable after making the decision required by paragraph 9(11). Similar duties apply in respect of interconnection directions under paragraph 22(10) of Schedule 18 to the Act. As set out in this Statement, Ofcom has now made that decision and so the duty to discontinue relevant regulation has arisen.

7.8 However, under paragraph 9(12)(b) of Schedule 18 where Ofcom has decided to set a condition to replace the continued provision, it must not give the discontinuation notice before the coming into force of that condition. A similar requirement applies in respect of interconnection directions under paragraph 22(10)(b) of Schedule 18 to the Act. As detailed below for the purposes of discontinuing relevant continued regulation Ofcom has made an assessment of the continued provisions which are relevant to this review, and which of the SMP conditions it has set are for the purpose of replacing those continued provisions.

Relevant continued regulation

7.9 The Director issued a consultation document "Discontinuing licence conditions after 25th July 2003" published on 2 October 2003 (available at http://www.ofcom.org.uk/static/archive/oftel/publications/eu_directives/2003/discont1003.pdf) (the "Discontinuation Consultation"), Ofcom consulted on the model discontinuation notice, the process for discontinuation and the appropriateness of discontinuing particular obligations including in respect of this particular market review. In that consultation it was explained at Annex 3 that the relevant continued provisions for this review were-

- Conditions 70A and 70B (Control of Interconnection Charges: Fixed to Mobile and Control of Interconnection Charges: Mobile to Mobile respectively) (which were continued in the continuation notices for Orange and T-Mobile); and

- Conditions 70B and 70C (Control of Interconnection Charges: Fixed to Mobile and Control of Interconnection Charges: Mobile to Mobile respectively) (which were continued in the continuation notices for Vodafone and O2).

In addition, it was explained that the Interconnection Direction (which was numbered 55) was relevant to this review. A statement "Discontinuing Licence Conditions" was subsequently published on 13 November 2003 (http://www.ofcom.org.uk/static/archive/oftel/publications/licensing/2003/discontinue1103.pdf) (the 'Discontinuation Statement").

7.10 The Director received three responses to the Discontinuation Consultation, but none of the points raised were specific to the process of discontinuation of regulations relating to this market. In relation to Orange and T-Mobile, therefore, Ofcom has decided that the regulations to be discontinued in this market should remain as set out in the Discontinuation Consultation and confirmed in the Discontinuation Statement. In relation to Vodafone and O2, Ofcom notes that other conditions were also carried forward in relation to those MNOs which could potentially be relevant to this Review, namely Conditions 45, 47, 48 and 49. To avoid any possible duplication of regulation therefore Ofcom has decided to also discontinue those continued provisions in so far as they apply to the markets covered by this review.

7.11 In relation to Condition 57, which was also continued for Vodafone and O2, as was proposed in paragraph 11 of the Discontinuation Consultation it was not considered necessary to discontinue Condition 57 on a market-by-market basis as it will cease to apply when other obligations, such as Condition 45, are discontinued. No responses on that specific issue were received following the Discontinuation Consultation and therefore Ofcom has decided to follow that same approach in relation to this Review.

The replacement SMP conditions

7.12 Ofcom has now concluded that the SMP conditions set out in the Notification at Annex A to, and Chapter 5 of, this explanatory statement should apply in the markets covered in this review. In relation to continued provisions Conditions 70A and 70B (which currently apply to T-Mobile and Orange as set out above), and Conditions 70B and 70C (which currently apply to Vodafone and O2), Ofcom has concluded that, as these continued provisons are charge controls, they are replaced by the new charge charge controls (Conditions MD3 and MD4 for Orange and T-Mobile, and Conditions MC3 and MC4 for Vodafone and O2). The new charge controls come into force on 1 September 2004. In relation all other continued conditions identified above i.e. Conditions 45, 47, 48 and 49, and the Interconnection Direction, Ofcom considers that these are being replaced by the other SMP conditions being set, which come into force on the date of publication of the Notification at Annex A.

The Discontinuation Notices

7.13 The notices given under paragraph 9 of Schedule 18 to the Act to discontinue continued provisions Conditions 70A and 70B (for Orange and T-Mobile), and Conditions 45, 47, 48 and 49 and Conditions 70B and 70C (for Vodafone and O2) (the "Paragraph 9 Discontinuation Notices"), are included at Annex H to this explanatory statement. The effect of those discontinuation notices will be to discontinue the continued provisions set out in the notices in so far as they apply to the markets covered by this review .The notice given to Vodafone, ntl and MCI under paragraph 22 of Schedule 18 to the Act revoking the Interconnection Direction (the "Paragraph 22 Discontinuation Notice") is also at Annex H.

Service of the Notices

7.14 With regard to the Paragraph 22 Discontinuation Notice, the Notice is deemed to be effected a day after publication and posting of the Notice. This is because, as referred to above, paragraph 22(10)(b) of Schedule 18 to the Act states that where Ofcom has decided to set a condition, a notice under paragraph 22 of Schedule 18 to the Act cannot be given until that condition is in force. As explained above Ofcom considers that the Interconnection Direction is replaced by the SMP conditions coming into force on publication of the Notification at Annex A. The Notice is therefore given on the date of publication of the Notification and is deemed to be effective the day after.

7.15 With regard to the Paragraph 9 Discontinuation Notices, for those given to Orange and T-Mobile the Notices are deemed to be effected on 2 September 2004 which is the day after the new charge controls come into force. This is because, as referred to above, paragraph 9(12)(b) of Schedule 18 to the Act provides that where Ofcom has decided to set a condition to replace the continued provision, it must not give the discontinuation notice before the coming into force of that condition. As explained above, Ofcom considers that Conditions 70A and 70B are replaced by the charge controls which do not come into force until 1 September 2004. The Notice is therefore given on the date of publication of the Notification but is not deemed to be effective until the day after the charge controls come into force.

7.16 In relation to the Paragraph 9 Discontinuation Notices given to Vodafone and O2, similar to the approach taken for the Paragraph 22 Discontinuation Notice the Notice is deemed to be effected a day after publication and posting of the notice, save in relation to Conditions 70B to 70C which are being replaced by the charge controls which do not come into force until 1 September 2004.

7.17 In addition, in accordance with section 7 of the Interpretation Act 1978 and section 394 (7) of the Act, as the discontinuation notices are being served by post, they will be deemed to be effected a working day after posting (unless otherwise stated in the notice).

7.18 Whilst for the reasons set out above the Paragraph 9 Discontinuation Notices do not take effect until 2 September 2004 in so far as they discontinue Conditions 70A to 70B for Orange and T-Mobile, and Conditions 70B to 70C for Vodafone and O2, as they will be subject to the new charge controls from 1 September 2004 the four MNOs will not be expected to comply with the relevant conditions in the Continuation Notices (i.e. Conditions 70B and 70C for

Vodafone and O2, and Conditions 70A and 70B for Orange and T-Mobile) as from 1 September 2004.

Annex A

Notification under section 48(1) and section 79(4) of the Communications Act 2003

The identification of certain services markets, the making of market power determinations in relation to those markets and the setting of SMP services conditions in relation to 3, Inquam, O2, Orange, T-Mobile and Vodafone under section 45 of the Communications Act 2003

WHEREAS:

(A) the Director General of Telecommunications (the "**Director**") made, in accordance with regulation 6 of the Electronic Communications (Market Analysis) Regulations 2003 (S.I. 2003/330), proposals for identifying certain services markets, making market power determinations in relation to those markets and the setting of SMP services conditions in relation to 3, Inquam, O2, Orange, T-Mobile and Vodafone by way of publication of a notification on 15 May 2003 (the "**First Notification**");

(B) by virtue of the Communications Act 2003 (Commencement No. 1) Order 2003 (S.I. 2003/1900 (C. 77)) made under sections 411 and 408 of the Act:

> (i) certain provisions of the Communications Act 2003 (the "**Act**") were commenced on 25 July 2003 for the purpose only of enabling the networks and services functions under those provisions to be carried out by the Director; and
>
> (ii) those provisions of the Act are to have effect as if references to the Office of Communications ("**Ofcom**") were references to the Director;

(C) having considered all responses duly made to the First Notification and revised certain of his proposed proposals in the light of those responses, the Director issued a further notification pursuant to sections 48(2) and 80 of the Act setting out his proposals for the identification of services markets, the making of market power determinations in relation to those markets and the setting of SMP services conditions in relation to 3, Inquam, O2, Orange, T-Mobile and Vodafone on 19th December 2003 (the "**Second Notification**");

(D) a copy of the Second Notification was sent to the Secretary of State for Trade and Industry (the "**Secretary of State**") in accordance with section 50(1)(a) of the Act, and to the European Commission and to the regulatory authorities of every other member State in accordance with sections 50(3) and 81 of the Act;

(E) in the Second Notification and the accompanying explanatory statement, the Director invited representations about any of the proposals set out therein by 6th February 2004, which was later extended to 10th February 2004;

(F) on 29 December 2003, Ofcom took over the responsibilities and assumed the powers of the five former regulators it has replaced, including the Director. In particular, by virtue of section 408(5) of the Act, anything done by or in relation to the Director during the period beginning on 25th July 2003 and ending on 29th December 2003 for the purposes of, or in connection with, the carrying out of networks and services functions is to have effect as if it had been done by or in relation to Ofcom.

(G) by virtue of section 80(6) of the Act, Ofcom may give effect to any proposals to identify a market for the purposes of making a market power determination or any proposals for making a market power determination set out in the First Notification, with or without modification, where:

(i) they have considered every representation about the proposals made to them within the period specified in the Second Notification; and

(ii) they have had regard to every international obligation of the United Kingdom (if any) which has been notified to them for this purpose by the Secretary of State; but

(iii) Ofcom's power to give effect to such proposals is subject to sections 82 and 83 of the Act;

(H) by virtue of section 48(5) of the Act, Ofcom may give effect to any proposals to set SMP services conditions set out in the Second Notification, with or without modification, where:

(i) they have considered every representation about the proposals made to them within the period specified in the Second Notification; and

(ii) they have had regard to every international obligation of the United Kingdom (if any) which has been notified to them for this purpose by the Secretary of State;

(I) Ofcom received eleven responses to the Second Notification and have considered every such representation duly made to them in respect of the proposals set out in the Second Notification and the accompanying explanatory statement; and the Secretary of State has not notified Ofcom of any international obligation of the United Kingdom for this purpose;

(J) the European Commission has not made a notification for the purposes of Article 7(4) of the Framework Directive as referred to in section 82 of the Act and the proposals do not relate to a transnational market as referred to in section 83 of the Act; and

NOW, therefore:

1. Ofcom identify, in accordance with section 79 of the Act, the following six services markets for the purposes of making market power determinations in relation to each of these markets:

(a) wholesale voice call termination provided by 3 (such termination being provided via 3's mobile network);

(b) wholesale voice call termination provided by Inquam (such termination being provided via Inquam's mobile network);

(c) wholesale voice call termination provided by O2 (such termination being provided via O2's 2G and 3G mobile network);

(d) wholesale voice call termination provided by Orange (such termination being provided via Orange's 2G and 3G mobile network);

(e) wholesale voice call termination provided by T-Mobile (such termination being provided via T-Mobile's 2G and 3G mobile network); and

(f) wholesale voice call termination provided by Vodafone (such termination being provided via Vodafone's 2G and 3G mobile network).

2. Ofcom make, in accordance with section 79 of the Act, the following market power determinations that the following persons each have significant market power:

(a) in relation to the market in sub-paragraph (a), 3;

(b) in relation to the market in sub-paragraph (b), Inquam;

(c) in relation to the market in sub-paragraph (c), O2;

(d) in relation to the market in sub-paragraph (d), Orange;

(e) in relation to the market in sub-paragraph (e), T-Mobile; and

(f) in relation to the market in sub-paragraph (f), Vodafone.

3. In accordance with sections 48(1) and 79 of the Act, Ofcom hereby set pursuant to section 45 of the Act the SMP services conditions on the persons referred in paragraph 2 above as set out in Schedules 1, 2, 3 and 4, respectively, to this Notification to take effect, unless otherwise is stated in those Schedules, on the date of publication of this Notification.

4. The effect of, and Ofcom's reasons for the decisions referred to in paragraphs 1 to 3 above are contained in the explanatory statement accompanying this Notification.

5. In making the decisions referred to in paragraphs 1 and 2, Ofcom have taken due account of all applicable guidelines and recommendations which have been issued or made by the European Commission in pursuance of a Community instrument, and relate to market identification or analysis, as required by section 79 of the Act.

6. In making the decisions referred to in paragraphs 1 to 3, Ofcom have considered and acted in accordance with the six Community requirements set out in section 4 of the Act and their duties in section 3 of the Act.

7. Ofcom consider that the SMP services conditions referred to in paragraph 3 above comply with the requirements of sections 45 to 50 and sections 78 to 92 of the Act, as appropriate and relevant to each such SMP services condition.

8. Copies of this Notification and the accompanying explanatory statement have been sent to the Secretary of State in accordance with section 50(1)(a) and section 81(1) of the Act and to the European Commission in accordance with sections 50(2) and 81(2) of the Act.

9. Save for the purposes of paragraph 1 above of this Notification and except as otherwise defined in this Notification, words or expressions used shall have the same meaning as they have been ascribed in the Act.

10. In this Notification (including its recitals):

(a) "3" means Hutchison 3G UK Limited (registered company number 3885486) including any of its subsidiaries or holding companies, or any subsidiary of such holding companies, all as defined by section 736 of the Companies Act 1985, as amended by the Companies Act 1989;

(b) “Act” means the Communications Act 2003;

(c) “Inquam” means Inquam Telecom (Holdings) Limited (registered company number 4244115) including any of its subsidiaries or holding companies, or any subsidiary of such holding companies, all as defined by section 736 of the Companies Act 1985, as amended by the Companies Act 1989;

(c) “O2” means O2 (UK) Limited (registered company number 1743099) including any of its subsidiaries or holding companies, or any subsidiary of such holding companies, all as defined by section 736 of the Companies Act 1985, as amended by the Companies Act 1989;

(d) “Ofcom” means the Office of Communications;

(e) “Orange” means Orange Personal Communications Services Limited (registered company number 2178917) including any of its subsidiaries or holding companies, or any subsidiary of such holding companies, all as defined by section 736 of the Companies Act 1985, as amended by the Companies Act 1989;

(f) “T-Mobile” means T-Mobile (UK) Limited (registered company number 2382161) including any of its subsidiaries or holding companies, or any subsidiary of such holding companies, all as defined by section 736 of the Companies Act 1985, as amended by the Companies Act 1989; and

(g) “Vodafone” means Vodafone Limited (registered company number 1471587) including any of its subsidiaries or holding companies, or any subsidiary of such holding companies, all as defined by section 736 of the Companies Act 1985, as amended by the Companies Act 1989.

Philip Rutnam
A person authorised by Ofcom under paragraph 18 of the Schedule to the Office of Communications Act 2002
28 May 2004

SCHEDULE 1

The SMP services condition imposed on 3 under sections 45 and 87 of the Communications Act 2003 as a result of the analysis of the services market set out in paragraph 1(a) of this Notification in which 3 has been found to have significant market power ("SMP condition")

Part 1: Application, definitions and interpretation relating to the SMP condition in Part 2

1. The SMP condition in Part 2 of this Schedule 1 shall, except insofar as it is otherwise stated therein, apply to the market set out in paragraph 1(a) of this Notification.

2. In this Schedule 1:

"**2G Public Electronic Communications Network**" means a mobile Public Electronic Communications Network which operates using spectrum within the bands 880 to 915 MHz, 925 to 960 MHz, 1710 to 1785 MHz, or 1805 to 1880 MHz;

"**2G Call**" means a circuit switched conveyance of a speech teleservice only (as defined in the relevant standards of the European Telecommunications Standards Institute) which:

(i) originates in a Public Electronic Communications Network (whether fixed or mobile);

(ii) is conveyed via the gateway mobile service switching centre of the Dominant Provider and the 2G Public Electronic Communications Network of another Communications Provider (the "2G Provider");

(iii) is terminated using the GSM air interface of the 2G Provider, or by agreement, of another Communications Provider; and

(iv) terminates on a GSM mobile handset of a Customer of the Dominant Provider.

For the purposes of this definition:

(a) "the relevant standards of the European Telecommunications Standards Institute" means the European Telecommunications Standard (ETS) of ETS 300 905 (GSM 02.03 version 5.3.2), Third Edition, January 1998, which has been produced by the Special Mobile Group of the European Telecommunications Standards Institute; and

(b) "GSM" means the Global System for Mobile communications, as defined in the relevant standards of the European Telecommunications Standards Institute;

"3G Public Electronic Communications Network" means a mobile Public Electronic Communications Network which operates using spectrum within the bands 1900 -1980 MHz or 2110 -2170 MHz;

“**3G Call**” means a circuit switched conveyance of a speech teleservice only (as defined in the relevant standards of the 3rd Generation Partnership Project) originating in a Public Electronic Communications Network (whether fixed or mobile) and which terminates on a mobile handset which is connected to the 3G Public Electronic Communications Network of the Dominant Provider.

For the purposes of this definition “the relevant standards of the 3rd Generation Partnership Project” means the following standards of the 3rd Generation Partnership Project-

(a) 3G TS 22.001 V3.2.0 (2000-03) (Technical Specification: Digital cellular telecommunications system (Phase 2+), Technical Specification Group Services and System Aspects, and Principles of circuit telecommunication services supported by a Public Land Mobile Network (PLAN)) (Release 1999);

(b) 3GPP TS 22.002 V3.6.0 (2001-03) (Technical Specification: Technical Specification Group Services and System Aspects, and Circuit Bearer Services (BS) supported by a Public Land Mobile Network (PLMN)) (Release 1999);

(c) 3G TS 22.003 V3.3.0 (2000-06) (Technical Specification: Technical Specification Group Services and System Aspects, and Circuit Teleservices supported by a Public Land Mobile Network (PLMN)) (Release 1999); and

(d) 3GPP TS 22.101 V 3.17.0 (2004-03) (Technical Specification: Technical Specification Group Services and System Aspects, Service aspects and Service principles) (Release 1999);

“**Access Charge Change Notice**” has the meaning given to it in Condition MA1.2;

“**Access Contract**” means a contract for the provision of Network Access;

"**Act**" means the Communications Act 2003;
“**Call**” means a 2G Call or a 3G Call;

“**Charging Period**” means any of the current charging periods published by the Dominant Provider;

"**Dominant Provider**" means Hutchison 3G UK Limited whose registered company number is 3885486 and any Hutchison 3G (UK) Limited subsidiary or holding company, or any subsidiary of that holding company, all as defined by section 736 of the Companies Act 1985 as amended by the Companies Act 1989;

“**Network Access**” means those services, facilities or arrangements which are necessary to terminate a 2G Call; and

"**Ofcom**" means the Office of Communications; and

“**Quarterly Period**” means a consecutive three month period, the first of which begins on 1 July 2004.

3. For the purpose of interpreting the SMP condition in Part 2 of this Schedule 1:

(a) except insofar as the context otherwise requires, words or expressions shall have the meaning ascribed to them in paragraph 2 above and otherwise any word or expression shall have the same meaning as it has in the Act;

(b) the Interpretation Act 1978 shall apply as if the SMP condition were an Act of Parliament; and

(c) headings and titles shall be disregarded.

Part 2: The SMP condition

Condition MA1 – Requirement to notify charges and call volumes

MA1.1 Except in so far as Ofcom may otherwise consent in writing, the Dominant Provider shall publish charges and act in the manner set out below.

MA 1.2 The Dominant Provider shall send to Ofcom and to every person with which it has entered into an Access Contract a written notice of any amendment to the charges on which it provides Network Access or in relation to any charges for new Network Access (an "Access Charge Change Notice") not less than 28 days before any such amendment comes into effect.

MA1.3 The Dominant Provider shall ensure that an Access Charge Change Notice includes:

a. a description of, and the proposed new charge for, the Network Access in question;

b. where applicable, the current charge for the Network Access in question; and

c. the date on which or the period for which any amendments to charges will take effect (the "effective date").

MA1.4 The Dominant Provider shall not apply any new charge identified in an Access Charge Change Notice before the effective date.

MA1.5 Except in so far as Ofcom may otherwise consent in writing, the Dominant Provider shall send to Ofcom no later than three months after the end of each Quarterly Period a written notice of:

a. the volume of minutes of 2G Calls by Charging Period; and

b. the volume of minutes of all Calls by Charging Period,

terminated during the Quarterly Period in question.

SCHEDULE 2

The SMP services condition imposed on Inquam under sections 45 and 87 of the Act as a result of the analysis of the market set out in paragraph 1(b) of this Notification in which Inquam has been found to have significant market power ("SMP condition")

Part 1: Application, definitions and Interpretation of these conditions

1. The SMP condition in Part 2 of this Schedule 2 shall, except insofar as it is otherwise stated therein, apply to the market set out in paragraph 1(b) of the Notification.

2. In this Schedule 2:

"**Access Charge Change Notice**" has the meaning given to it in Condition MB1.2;

"**Act**" means the Communications Act 2003;

"**Dominant Provider**" means Inquam Telecom (Holdings) Limited, whose registered company number is 4244115 and any Inquam Telecom (Holdings) Limited subsidiary or holding company, or any subsidiary of that holding company, all as defined by section 736 of the Companies Act 1985 as amended by the Companies Act 1989; and

"**Ofcom**" means the Office of Communications.

3. For the purpose of interpreting the SMP condition in Part 2 of this Schedule 2:

(a) except insofar as the context otherwise requires, words or expressions shall have the meaning ascribed to them in paragraph 2 above and otherwise any word or expression shall have the same meaning as it has in the Act;

(b) the Interpretation Act 1978 shall apply as if the SMP condition were an Act of Parliament; and

(c) headings and titles shall be disregarded.

Part 2: The SMP condition

Condition MB1 – Requirement to notify charges

MB1.1 Except in so far as Ofcom may otherwise consent in writing, the Dominant Provider shall publish charges and act in the manner set out below.

MB1.2 The Dominant Provider shall send to Ofcom and to every person with which it has entered into an Access Contract a written notice of any amendment to the charges on which it provides Network Access or in relation to any charges for new Network Access (an "Access Charge Change Notice") not less than 28 days before any such amendment comes into effect.

MB1.3 The Dominant Provider shall ensure that an Access Charge Change Notice includes:

a. a description of, and the proposed new charge for the Network Access in question;

b. where applicable, the current charge for the Network Access in question; and

c. the date on which or the period for which any amendments to charges will take effect (the "effective date").

MB1.4 The Dominant Provider shall not apply any new charge identified in an Access Charge Change Notice before the effective date.

SCHEDULE 3

The SMP services conditions imposed on O2 and Vodafone under sections 45, 87 and 88 of the Act as a result of the analysis of the market set out in paragraph 1(c) of this Notification, in which O2 has been found to have significant market power, and the market set out in paragraph 1(f) of this Notification, in which Vodafone has been found to have significant market power ("SMP conditions")

Part 1: Application, definitions and Interpretation of these conditions

1. The SMP conditions in Part 2 of this Schedule 3 shall, except insofar as it is otherwise stated therein, apply to the markets set out in paragraphs 1(c) and 1(f) of the Notification.

2. In this Schedule 3:

"**2G Public Electronic Communications Network**" means a mobile Public Electronic Communications Network which operates using spectrum within the bands 880 to 915 MHz, 925 to 960 MHz, 1710 to 1785 MHz, or 1805 to 1880 MHz;

"**Access Charge Change Notice**" has the meaning given to it in Condition MC6.2;

"**Access Contract**" means a contract for the provision of Network Access;

"**Act**" means the Communications Act 2003;

"**Base Year**" means:

(a) for the First Relevant Year, the period of 7 months ending on 31 March immediately preceding that Relevant Year;

(b) for the Second Relevant Year, the period of 12 months ending on 31 March immediately preceding that Relevant Year;

"**Call**" means a circuit switched conveyance of a speech teleservice only (as defined in the relevant standards of the European Telecommunications Standards Institute) originating in a Public Electronic Communications Network (whether fixed or mobile) and which terminates on a GSM mobile handset using the GSM air interface for the conveyance of that speech call, which is connected to the 2G Public Electronic Communications Network of the Dominant Provider.

For the purposes of this definition:

(a) "the relevant standards of the European Telecommunications Standards Institute" means the European Telecommunications Standard (ETS) of ETS 300 905 (GSM 02.03 version 5.3.2), Third Edition, January 1998, which has been produced by the Special Mobile Group of the European Telecommunications Standards Institute; and

(b) "GSM" means the Global System for Mobile communications, as defined in the relevant standards of the European Telecommunications Standards Institute;

“**Charging Period**” means any of the current charging periods published by the Dominant Provider;

“**Director”** means the Director-General of Telecommunications as appointed under section 1 of the Telecommunications Act 1984;

"**Dominant Provider**" means:

(a) O2 (UK) Limited, whose registered company number is 1743099;

(b) Vodafone Limited, whose registered company number is 1471587;

and any subsidiary or holding company of the companies listed in (a) to (b) above, or any subsidiary of that holding company, all as defined by Section 736 of the Companies Act 1985 as amended by the Companies Act 1989;

“**Fixed-to-Mobile Call**” means a Call originating in a fixed Public Electronic Communications Network only excluding any Calls to Ported-In Numbers;

“**Fixed-to-Mobile Interconnection Charge**” means the published charge made by the Dominant Provider for the Interconnection of a Fixed-to-Mobile Call, excluding any discounts offered by the Dominant Provider, whether in respect of any particular Customer or any category of Customers or any category of Calls;

“**Functional Specification**” shall have the same meaning as in Condition 18 of the General Conditions of Entitlement;

“**General Conditions of Entitlement**” means those general conditions set by the Director by way of publication of a Notification under section 48(1) of the Act on 22 July 2003;

“**Mobile-to-Mobile Call**” means a Call originating in a mobile Public Electronic Communications Network of another Communications Provider excluding any Calls to Ported-In Numbers;

“**Mobile-to-Mobile Interconnection Charge**” means the published charge made by the Dominant Provider for the Interconnection of a Mobile-to-Mobile Call, excluding any discounts offered by the Dominant Provider, whether in respect of any particular Customer or any category of Customers or any category of Calls;

“**Network Access**” means the provision of Interconnection to the 2G Public Electronic Communications Network provided by the Dominant Provider, together with any services, facilities or arrangements which are necessary for the provision of Electronic Communications Services over that Interconnection;

“Ofcom” means the Office of Communications;

“Ported-In Number” means a Subscriber Number which has been passed to or ported to the Dominant Provider;

“Relevant Year” means either of the following

(i) the period of 7 months beginning on 1 September 2004 and ending on 31 March 2005 (the “First Relevant Year”); or

(ii) the period of 12 months beginning on 1 April 2005 and ending on 31 March 2006 (the "Second Relevant Year");

"**Retail Prices Index**" means the index of retail prices compiled by an agency or a public body on behalf of Her Majesty's Government or a governmental department from time to time in respect of all items (which is the Office for National Statistics at the time of publication of this Notification);

"**Subscriber Number**" shall have the same meaning as in the Functional Specification; and

"**Third Party**" means a person providing a Public Electronic Communications Network.

3. For the purpose of interpreting the SMP conditions in Part 2 of this Schedule 3:

(a) except insofar as the context otherwise requires, words or expressions shall have the meaning ascribed to them in paragraph 2 above and otherwise any word or expression shall have the same meaning as it has in the Act;

(b) the Interpretation Act 1978 shall apply as if each of the SMP conditions were an Act of Parliament; and

(c) headings and titles shall be disregarded.

Part 2: The SMP conditions

Condition MC1 – Requirement to provide network access on reasonable request

MC1.1 Where a Third Party reasonably requests in writing Network Access, the Dominant Provider shall provide that Network Access. The Dominant Provider shall also provide such Network Access as Ofcom may from time to time direct.

MC1.2 The provision of Network Access in accordance with paragraph MC1.1 shall occur as soon as reasonably practicable and shall be provided on fair and reasonable terms, conditions and charges and on such terms, conditions and charges as Ofcom may from time to time direct.

MC1.3 The Dominant Provider shall comply with any direction Ofcom may make from time to time under this Condition.

Condition MC2 – Requirement not to unduly discriminate

MC2.1 The Dominant Provider shall not unduly discriminate against particular persons or against a particular description of persons, in relation to matters connected with Network Access.

Condition MC3 – Control of Fixed-to-Mobile Interconnection Charges

MC3.1 Except in so far as Ofcom otherwise consent under paragraph MC3.9 below, the Dominant Provider shall take all reasonable steps to secure that, during any Relevant Year, the Average Interconnection Charge does not exceed the Target Average Charge for any such Year.

MC3.2 In this Condition, the Average Interconnection Charge means the average of the Fixed-to-Mobile Interconnection Charges during the Relevant Year in question, which shall be weighted according to:

(a) the profile by Charging Period of the Dominant Provider's minutes of Fixed-to-Mobile Calls; and

(b) the volumes by month or part-month of the Dominant Provider's minutes of Fixed-to-Mobile Calls (except in so far as Ofcom otherwise consent in writing that the weighting shall be derived from the sum of minutes of Fixed-to-Mobile Calls and Mobile-to-Mobile Calls),

in the Base Year.

MC3.3 For the purposes of calculating the Average Interconnection Charge where any Fixed-to-Mobile Interconnection Charges are in force during a part only of the Relevant Year (commencing or ending at a date in the course of the Relevant Year), the weighting shall be derived from:

(a) the profile by Charging Period of the Dominant Provider's minutes of Fixed-to-Mobile Calls; and

(b) the volumes by month or part-month of the Dominant Provider's minutes of Fixed-to-Mobile Calls (except in so far as Ofcom otherwise consent in writing that the weighting shall be derived from the sum of minutes of Fixed-to-Mobile Calls and Mobile-to-Mobile Calls),

in the corresponding part of the Base Year.

MC3.4 For the purposes of this Condition, the Target Average Charge means**:**

(a) for the purpose of the First Relevant Year, 5.63 pence per minute; and

(b) for the purpose of the Second Relevant Year, 5.63 pence per minute multiplied by the Weights Adjustment Factor.

MC3.5 In paragraph MC3.4:

(a) the Weights Adjustment Factor means the Average Revenue divided by the Average Interconnection Charge in the First Relevant Year; and

(b) the Average Revenue means the average of the Fixed-to-Mobile Interconnection Charges during the First Relevant Year, weighted according to:

(i) the profile by Charging Period of the Dominant Provider's minutes of Fixed-to-Mobile Calls; and

(ii) the volumes by month or part-month of the Dominant Provider's minutes of Fixed-to-Mobile Calls (except in so far as Ofcom otherwise consents in writing that the weighting shall be derived from the sum of minutes of Fixed-to-Mobile Calls and Mobile-to-Mobile Calls),

in the First Relevant Year.

MC3.6 For the purposes of calculating the Average Revenue where any Fixed-to-Mobile Interconnection Charges are in force during a part only of the First Relevant Year (commencing or ending at a date in the course of the First Relevant Year), the weighting shall be derived from:

(a) the profile by Charging Period of the Dominant Provider's minutes of Fixed-to-Mobile Calls; and

(b) the volumes by month or part-month of the Dominant Provider's minutes of Fixed-to-Mobile Calls (except in so far as the Director otherwise consents in writing that the weighting shall be derived from the sum of minutes of Fixed-to-Mobile Calls and Mobile-to-Mobile Calls),

in that part of the First Relevant Year.

MC3.7 The Dominant Provider shall not make any Fixed-to-Mobile Interconnection Charge for:

(a) a Fixed-to-Mobile Call which terminates on a recorded announcement provided by the Dominant Provider informing the caller of an inability to complete that call so as to establish a two-way path where the mobile handset used by the called party is switched off, or rings and remains unanswered, or where coverage is not available from the Dominant Provider's 2G Public Electronic Communications Network; and

(b) an unanswered Fixed-to-Mobile Call which is diverted in respect of the period before that call is answered.

MC3.8 Notwithstanding (and without prejudice to the generality of) the obligation imposed on the Dominant Provider by paragraph MC3.1 above:

(a) if the Dominant Provider has failed to secure that the Average Interconnection Charge has not exceeded the Target Average Charge for the First Relevant Year, the Dominant Provider shall make such adjustments to its Fixed-to-Mobile Interconnection Charges and by such day in the Second Relevant Year as Ofcom may direct for the purpose of remedying that failure. Such adjustments in the Second Relevant Year shall not be relevant for the purpose of establishing compliance with paragraph MC3.1 above in that Relevant Year;

and

(b) if it appears to Ofcom that the Dominant Provider is likely to fail to secure that the Average Interconnection Charge for the Second Relevant Year does not exceed the Target Average Charge for that Year, the Dominant Provider shall make such adjustments to its Fixed-to-Mobile Interconnection Charges and by such day in that Year as Ofcom may direct for the purpose of avoiding that failure.

MC3.9 Where the Average Interconnection Charge is less than the Target Average Charge for the First Relevant Year, the Dominant Provider shall not make such adjustments to its Fixed-to-Mobile Interconnection Charges in the Second Relevant Year to recover the difference between the Average Interconnection Charge and the Target Average Charge for the First Relevant Year, unless Ofcom have given their prior written consent to such adjustments. Such adjustments in the Second Relevant Year shall not be relevant for the purpose of establishing compliance with paragraph MC3.1 in that Relevant Year.

MC3.10 In this Condition:

‘**Average Interconnection Charge**’ has the meaning given to it in paragraph MC3.2;

‘**Average Revenue**’ has the meaning given to it in paragraph MC3.5;

‘**Target Average Charge**’ shall have the meaning given to it in paragraph MC3.4; and

‘**Weights Adjustment Factor**’ has the meaning given to it in paragraph MC3.5.

Condition MC4 - Control of Mobile to Mobile Interconnection Charges

MC4.1 Except in so far as Ofcom otherwise consent under paragraph MC4.9 below, the Dominant Provider shall take all reasonable steps to secure that, during any Relevant Year, the Average Interconnection Charge does not exceed the Target Average Charge for any such Year.

MC4.2 In this Condition, the Average Interconnection Charge means the average of the Mobile-to-Mobile Interconnection Charges during the Relevant Year in question, which shall be weighted according to:

(a) the profile by Charging Period of the Dominant Provider's minutes of Mobile-to-Mobile Calls; and

(b) the volumes by month or part-month of the Dominant Provider's minutes of Mobile-to-Mobile Calls (except in so far as Ofcom otherwise consent in writing that the weighting shall be derived from the sum of minutes of Fixed-to-Mobile Calls and Mobile-to-Mobile Calls),

in the Base Year.

MC4.3 For the purposes of calculating the Average Interconnection Charge where any Mobile-to-Mobile Interconnection Charges are in force during a part only of the Relevant Year (commencing or ending at a date in the course of the Relevant Year), the weighting shall be derived from:

(a) the profile by Charging Period of the Dominant Provider's minutes of Mobile-to-Mobile Calls; and

(b) the volumes by month or part-month of the Dominant Provider's minutes of Mobile-to-Mobile Calls (except in so far as Ofcom otherwise consent in writing that the weighting shall be derived from the sum of minutes of Fixed-to-Mobile Calls and Mobile-to-Mobile Calls),

in the corresponding part of the Base Year.

MC4.4 For the purposes of this Condition, the Target Average Charge means**:**

(a) for the purpose of the First Relevant Year, 5.63 pence per minute; and

(b) for the purpose of the Second Relevant Year, 5.63 pence per minute multiplied by the Weights Adjustment Factor.

MC4.5 In paragraph MC4.4:

(a) the Weights Adjustment Factor means the Average Revenue divided by the Average Interconnection Charge in the First Relevant Year; and

(b) the Average Revenue means the average of the Mobile-to-Mobile Interconnection Charges during the First Relevant Year, weighted according to:

(i) the profile by Charging Period of the Dominant Provider's minutes of Mobile-to-Mobile Calls; and

(ii) the volumes by month or part-month of the Dominant Provider's minutes of Mobile-to-Mobile Calls (except in so far as Ofcom otherwise consents in writing that the weighting shall be derived from the sum of minutes of Fixed-to-Mobile Calls and Mobile-to-Mobile Calls),

in the First Relevant Year.

MC4.6 For the purposes of calculating the Average Revenue where any Mobile-to-Mobile Interconnection Charges are in force during a part only of the First Relevant Year (commencing or ending at a date in the course of the First Relevant Year), the weighting shall be derived from:

(a) the profile by Charging Period of the Dominant Provider's minutes of Mobile-to-Mobile Calls; and

(b) the volumes by month or part-month of the Dominant Provider's minutes of Mobile-to-Mobile Calls (except in so far as the Director otherwise consents in writing that the weighting shall be derived from the sum of minutes of Fixed-to-Mobile Calls and Mobile-to-Mobile Calls),

in that part of the First Relevant Year.

MC4.7 The Dominant Provider shall not make any Mobile-to-Mobile Interconnection Charge for:

(a) a Mobile-to-Mobile Call which terminates on a recorded announcement provided by the Dominant Provider informing the caller of an inability to complete that call so as to establish a two-way path where the mobile handset used by the called party is switched off, or rings and remains unanswered, or where coverage is not available from the Dominant Provider's 2G Public Electronic Communications Network; and

(b) an unanswered Mobile-to-Mobile Call which is diverted in respect of the period before that call is answered.

MC4.8 Notwithstanding (and without prejudice to the generality of) the obligation imposed on the Dominant Provider by paragraph MC4.1 above:

(a) if the Dominant Provider has failed to secure that the Average Interconnection Charge has not exceeded the Target Average Charge for the First Relevant Year, the Dominant Provider shall make such adjustments to its Mobile-to-Mobile Interconnection Charges and by such day in the Second Relevant Year as Ofcom may direct for the purpose of remedying that failure. Such adjustments in the Second Relevant Year shall not be relevant for the purpose of establishing compliance with paragraph MC4.1 above in that Relevant Year;

and

(b) if it appears to Ofcom that the Dominant Provider is likely to fail to secure that the Average Interconnection Charge for the Second Relevant Year does not exceed the Target Average Charge for that Year, the Dominant Provider shall make such adjustments to its Mobile-to-Mobile Interconnection

Charges and by such day in that Year as Ofcom may direct for the purpose of avoiding that failure.

MC4.9 Where the Average Interconnection Charge is less than the Target Average Charge for the First Relevant Year, the Dominant Provider shall not make such adjustments to its Mobile-to-Mobile Interconnection Charges in the Second Relevant Year to recover the difference between the Average Interconnection Charge and the Target Average Charge for the First Relevant Year, unless Ofcom have given their prior written consent to such adjustments. Such adjustments in the Second Relevant Year shall not be relevant for the purpose of establishing compliance with paragraph MC4.1 in that Relevant Year.

MC4.10 In this Condition:

‘**Average Interconnection Charge**’ has the meaning given to it in paragraph MC4.2;

‘**Average Revenue**’ has the meaning given to it in paragraph MC4.5;

‘**Target Average Charge**’ shall have the meaning given to it in paragraph MC4.4; and

‘**Weights Adjustment Factor**’ has the meaning given to it in paragraph MC4.5.

Condition MC5 – Requirement to publish Access Contracts

MC5.1 Except in so far as Ofcom may otherwise consent in writing, the Dominant Provider shall publish its Access Contracts and act in the manner set out below.

MC5.2 The Dominant Provider shall, within 28 days of the date that this Condition comes into force, send to Ofcom its existing Access Contracts.

MC5.3 Without prejudice to Condition MC6, the Dominant Provider shall send to Ofcom any amendments to its existing Access Contracts and any new Access Contracts within 28 days of the date on which those amendments, or new Access Contracts, come into force.

Condition MC6 – Requirement to notify charges

MC6.1 Except in so far as Ofcom may otherwise consent in writing, the Dominant Provider shall publish charges and act in the manner set out below.

MC6.2 Save as is otherwise provided in paragraph MC6.5 the Dominant Provider shall send to Ofcom and to every person with which it has entered into an Access Contract a written notice of any amendment to the charges on which it provides Network Access or in relation to any charges for new Network Access (an "Access Charge Change Notice") not less than 28 days before any such amendment comes into effect.

MC6.3 The Dominant Provider shall ensure that an Access Charge Change Notice includes:

a. a description of, and the proposed new charge for the Network Access in question;

b. where applicable, the current charge for the Network Access in question; and

c. the date on which or the period for which any amendments to charges will take effect (the "effective date").

MC6.4 The Dominant Provider shall not apply any new charge identified in an Access Charge Change Notice before the effective date.

MC6.5 The Dominant Provider shall send to Ofcom and to every person with which it has entered into an Access Contract a written notice of the charges which will be in effect on 1 September 2004 on which the Dominant Provider provides Network Access no later than 28 days after the date this Condition comes into force.

SCHEDULE 4

The SMP services conditions imposed on Orange and T-Mobile under sections 45, 87 and 88 of the Act as a result of the analysis of the market set out in paragraph 1(d) of this Notification, in which Orange has been found to have significant market power, and the market set out in paragraph 1(e) of this Notification, in which T-Mobile has been found to have significant market power ("SMP conditions")

Part 1: Application, definitions and Interpretation of these conditions

1. The SMP conditions in Part 2 of this Schedule 4 shall, except insofar as it is otherwise stated therein, apply to the markets set out in paragraphs 1(d) and 1(e) of the Notification.

2. In this Schedule 4:

"**2G Public Electronic Communications Network**" means a mobile Public Electronic Communications Network which operates using spectrum within the bands 880 to 915 MHz, 925 to 960 MHz, 1710 to 1785 MHz, or 1805 to 1880 MHz;

"**Access Charge Change Notice**" has the meaning given to it in Condition MD6.2;

"**Access Contract**" means a contract for the provision of Network Access;

"**Act**" means the Communications Act 2003;

"**Base Year**" means:

(a) for the First Relevant Year, the period of 7 months ending on 31 March immediately preceding that Relevant Year;

(b) for the Second Relevant Year, the period of 12 months ending on 31 March immediately preceding that Relevant Year;

"**Call**" means a circuit switched conveyance of a speech teleservice only (as defined in the relevant standards of the European Telecommunications Standards Institute) originating in a Public Electronic Communications Network (whether fixed or mobile) and which terminates on a GSM mobile handset using the GSM air interface for the conveyance of that speech call, which is connected to the 2G Public Electronic Communications Network of the Dominant Provider.

For the purposes of this definition:

(a) "the relevant standards of the European Telecommunications Standards Institute" means the European Telecommunications Standard (ETS) of ETS 300 905 (GSM 02.03 version 5.3.2), Third Edition, January 1998, which has been produced by the Special Mobile Group of the European Telecommunications Standards Institute.

(b) "GSM" means the Global System for Mobile communications, as defined in the relevant standards of the European Telecommunications

Standards Institute.

“Charging Period” means any of the current charging periods published by the Dominant Provider;

“**Director”** means the Director-General of Telecommunications as appointed under section 1 of the Telecommunications Act 1984;

"Dominant Provider" means:

(a) Orange Personal Communications Services Limited, whose registered company number is 2178917;

(b) T-Mobile (UK) Limited, whose registered company number is 2382161;

and any subsidiary or holding company of the companies listed in (a) to (b) above, or any subsidiary of that holding company, all as defined by section 736 of the Companies Act 1985 as amended by the Companies Act 1989;

“**Fixed-to-Mobile Call**” means a Call originating in a fixed Public Electronic Communications Network only excluding any Calls to Ported-In Numbers;

“**Fixed-to-Mobile Interconnection Charge**” means the published charge made by the Dominant Provider for the Interconnection of a Fixed-to-Mobile Call, excluding any discounts offered by the Dominant Provider, whether in respect of any particular Customer or any category of Customers or any category of Calls;

“Functional Specification” shall have the same meaning as Condition 18 of the General Conditions of Entitlement;

“**General Conditions of Entitlement**” means those general conditions set by the Director by way of publication of a Notification under section 48(1) of the Act on 22 July 2003;

“**Mobile-to-Mobile Call**” means a Call originating in a mobile Public Electronic Communications Network of another Communications Provider excluding any Calls to Ported-In Numbers;

“**Mobile-to-Mobile Interconnection Charge**” means the published charge made by the Dominant Provider for the Interconnection of a Mobile-to-Mobile Call, excluding any discounts offered by the Dominant Provider, whether in respect of any particular Customer or any category of Customers or any category of Calls;

“**Network Access**” means the provision of Interconnection to the 2G Public Electronic Communications Network provided by the Dominant Provider, together with any services, facilities or arrangements which are necessary for the provision of Electronic Communications Services over that Interconnection;

“Ofcom” means the Office of Communications;

“Ported-In Number” means a Subscriber Number which has been passed to or ported to the Dominant Provider;

“Relevant Year” means either of the following

(i) the period of 7 months beginning on 1 September 2004 and ending on 31 March 2005 (the "First Relevant Year"); or

(ii) the period of 12 months beginning on 1 April 2005 and ending on 31 March 2006 (the "Second Relevant Year");

"**Retail Prices Index**" means the index of retail prices compiled by an agency or a public body on behalf of Her Majesty's Government or a governmental department from time to time in respect of all items (which is the Office for National Statistics at the time of publication of this Notification);

"**Subscriber Number**" shall have the same meaning as in the Functional Specification; and

"**Third Party**" means a person providing a Public Electronic Communications Network.

3. For the purpose of interpreting the SMP conditions in Part 2 of this Schedule 4:

(a) except insofar as the context otherwise requires, words or expressions shall have the meaning ascribed to them in paragraph 2 above and otherwise any word or expression shall have the same meaning as it has in the Act;

(b) the Interpretation Act 1978 shall apply as if each of the SMP conditions were an Act of Parliament; and

(c) headings and titles shall be disregarded.

Part 2: The conditions

Condition MD1 – Requirement to provide network access on reasonable request

MD1.1 Where a Third Party reasonably requests in writing Network Access, the Dominant Provider shall provide that Network Access. The Dominant Provider shall also provide such Network Access as Ofcom may from time to time direct.

MD1.2 The provision of Network Access in accordance with paragraph MD1.1 shall occur as soon as reasonably practicable and shall be provided on fair and reasonable terms, conditions and charges and on such terms, conditions and charges as Ofcom may from time to time direct.

MD1.3 The Dominant Provider shall comply with any direction Ofcom may make from time to time under this Condition.

Condition MD2 – Requirement not to unduly discriminate

MD2.1 The Dominant Provider shall not unduly discriminate against particular persons or against a particular description of persons, in relation to matters connected with Network Access.

Condition MD3 – Control of Fixed-to-Mobile Interconnection Charges

MD3.1 Except in so far as Ofcom otherwise consent under paragraph MD3.9 below, the Dominant Provider shall take all reasonable steps to secure that, during any Relevant Year, the Average Interconnection Charge does not exceed the Target Average Charge for any such Year.

MD3.2 In this Condition, the Average Interconnection Charge means the average of the Fixed-to-Mobile Interconnection Charges during the Relevant Year in question, which shall be weighted according to:

(a) the profile by Charging Period of the Dominant Provider's minutes of Fixed-to-Mobile Calls; and

(b) the volumes by month or part-month of the Dominant Provider's minutes of Fixed-to-Mobile Calls (except in so far as Ofcom otherwise consent in writing that the weighting shall be derived from the sum of minutes of Fixed-to-Mobile Calls and Mobile-to-Mobile Calls),

in the Base Year.

MD3.3 For the purposes of calculating the Average Interconnection Charge where any Fixed-to-Mobile Interconnection Charges are in force during a part only of the Relevant Year (commencing or ending at a date in the course of the Relevant Year), the weighting shall be derived from:

(a) the profile by Charging Period of the Dominant Provider's minutes of Fixed-to-Mobile Calls; and

(b) the volumes by month or part-month of the Dominant Provider's minutes of Fixed-to-Mobile Calls (except in so far as Ofcom otherwise consent in writing that the weighting shall be derived from the sum of minutes of Fixed-to-Mobile Calls and Mobile-to-Mobile Calls),

in the corresponding part of the Base Year.

MD3.4 For the purposes of this Condition, the Target Average Charge means**:**

(a) for the purpose of the First Relevant Year, 6.31 pence per minute; and

(b) for the purpose of the Second Relevant Year, 6.31 pence per minute multiplied by the Weights Adjustment Factor.

MD3.5 In paragraph MD3.4:

(a) the Weights Adjustment Factor means the Average Revenue divided by the Average Interconnection Charge in the First Relevant Year; and

(b) the Average Revenue means the average of the Fixed-to-Mobile Interconnection Charges during the First Relevant Year, weighted according to:

(i) the profile by Charging Period of the Dominant Provider's minutes of Fixed-to-Mobile Calls; and

(ii) the volumes by month or part-month of the Dominant Provider's minutes of Fixed-to-Mobile Calls (except in so far as Ofcom otherwise consents in writing that the weighting shall be derived from the sum of minutes of Fixed-to-Mobile Calls and Mobile-to-Mobile Calls),

in the First Relevant Year.

MD3.6 For the purposes of calculating the Average Revenue where any Fixed-to-Mobile Interconnection Charges are in force during a part only of the First Relevant Year (commencing or ending at a date in the course of the First Relevant Year), the weighting shall be derived from:

(a) the profile by Charging Period of the Dominant Provider's minutes of Fixed-to-Mobile Calls; and

(b) the volumes by month or part-month of the Dominant Provider's minutes of Fixed-to-Mobile Calls (except in so far as the Director otherwise consents in writing that the weighting shall be derived from the sum of minutes of Fixed-to-Mobile Calls and Mobile-to-Mobile Calls),

in that part of the First Relevant Year.

MD3.7 The Dominant Provider shall not make any Fixed-to-Mobile Interconnection Charge for:

(a) a Fixed-to-Mobile Call which terminates on a recorded announcement provided by the Dominant Provider informing the caller of an inability to complete that call so as to establish a two-way path where the mobile handset used by the called party is switched off, or rings and remains unanswered, or where coverage is not available from the Dominant Provider's 2G Public Electronic Communications Network; and

(b) an unanswered Fixed-to-Mobile Call which is diverted in respect of the period before that call is answered.

MD3.8 Notwithstanding (and without prejudice to the generality of) the obligation imposed on the Dominant Provider by paragraph MD3.1 above:

(a) if the Dominant Provider has failed to secure that the Average Interconnection Charge has not exceeded the Target Average Charge for the First Relevant Year, the Dominant Provider shall make such adjustments to its Fixed-to-Mobile Interconnection Charges and by such day in the Second Relevant Year as Ofcom may direct for the purpose of remedying that failure. Such adjustments in the Second Relevant Year shall not be relevant for the purpose of establishing compliance with paragraph MD3.1 above in that Relevant Year;

and

(b) if it appears to Ofcom that the Dominant Provider is likely to fail to secure that the Average Interconnection Charge for the Second Relevant Year does not exceed the Target Average Charge for that Year, the Dominant

Provider shall make such adjustments to its Fixed-to-Mobile Interconnection Charges and by such day in that Year as Ofcom may direct for the purpose of avoiding that failure.

MD3.9 Where the Average Interconnection Charge is less than the Target Average Charge for the First Relevant Year, the Dominant Provider shall not make such adjustments to its Fixed-to-Mobile Interconnection Charges in the Second Relevant Year to recover the difference between the Average Interconnection Charge and the Target Average Charge for the First Relevant Year, unless Ofcom have given their prior written consent to such adjustments. Such adjustments in the Second Relevant Year shall not be relevant for the purpose of establishing compliance with paragraph MD3.1 in that Relevant Year.

MD3.10 In this Condition:

'**Average Interconnection Charge**' has the meaning given to it in paragraph MD3.2;

'**Average Revenue**' has the meaning given to it in paragraph MD3.5;

'**Target Average Charge**' shall have the meaning given to it in paragraph MD3.4; and

'**Weights Adjustment Factor**' has the meaning given to it in paragraph MD3.5.

Condition MD4 - Control of Mobile to Mobile Interconnection Charges

MD4.1 Except in so far as Ofcom otherwise consent under paragraph MD4.9 below, the Dominant Provider shall take all reasonable steps to secure that, during any Relevant Year, the Average Interconnection Charge does not exceed the Target Average Charge for any such Year.

MD4.2 In this Condition, the Average Interconnection Charge means the average of the Mobile-to-Mobile Interconnection Charges during the Relevant Year in question, which shall be weighted according to:

(a) the profile by Charging Period of the Dominant Provider's minutes of Mobile-to-Mobile Calls; and

(b) the volumes by month or part-month of the Dominant Provider's minutes of Mobile-to-Mobile Calls (except in so far as Ofcom otherwise consent in writing that the weighting shall be derived from the sum of minutes of Fixed-to-Mobile Calls and Mobile-to-Mobile Calls),

in the Base Year.

MD4.3 For the purposes of calculating the Average Interconnection Charge where any Mobile-to-Mobile Interconnection Charges are in force during a part only of the Relevant Year (commencing or ending at a date in the course of the Relevant Year), the weighting shall be derived from:

(a) the profile by Charging Period of the Dominant Provider's minutes of Mobile-to-Mobile Calls; and

(b) the volumes by month or part-month of the Dominant Provider's minutes of Mobile-to-Mobile Calls (except in so far as Ofcom otherwise consent in writing that the weighting shall be derived from the sum of minutes of Fixed-to-Mobile Calls and Mobile-to-Mobile Calls),

in the corresponding part of the Base Year.

MD4.4 For the purposes of this Condition, the Target Average Charge means**:**

(a) for the purpose of the First Relevant Year, 6.31 pence per minute; and

(b) for the purpose of the Second Relevant Year, 6.31 pence per minute multiplied by the Weights Adjustment Factor.

MD4.5 In paragraph MD4.4:

(a) the Weights Adjustment Factor means the Average Revenue divided by the Average Interconnection Charge in the First Relevant Year; and

(b) the Average Revenue means the average of the Mobile-to-Mobile Interconnection Charges during the First Relevant Year, weighted according to:

(i) the profile by Charging Period of the Dominant Provider's minutes of Mobile-to-Mobile Calls; and

(ii) the volumes by month or part-month of the Dominant Provider's minutes of Mobile-to-Mobile Calls (except in so far as Ofcom otherwise consents in writing that the weighting shall be derived from the sum of minutes of Fixed-to-Mobile Calls and Mobile-to-Mobile Calls),

in the First Relevant Year.

MD4.6 For the purposes of calculating the Average Revenue where any Mobile-to-Mobile Interconnection Charges are in force during a part only of the First Relevant Year (commencing or ending at a date in the course of the First Relevant Year), the weighting shall be derived from:

(a) the profile by Charging Period of the Dominant Provider's minutes of Mobile-to-Mobile Calls; and

(b) the volumes by month or part-month of the Dominant Provider's minutes of Mobile-to-Mobile Calls (except in so far as the Director otherwise consents in writing that the weighting shall be derived from the sum of minutes of Fixed-to-Mobile Calls and Mobile-to-Mobile Calls),

in that part of the First Relevant Year.

MD4.7 The Dominant Provider shall not make any Mobile-to-Mobile Interconnection Charge for:

(a) a Mobile-to-Mobile Call which terminates on a recorded announcement provided by the Dominant Provider informing the caller of an inability to complete that call so as to establish a two-way path where the mobile handset used by the called party is switched off, or rings and remains unanswered, or where coverage is not available from the Dominant Provider's 2G Public Electronic Communications Network; and

(b) an unanswered Mobile-to-Mobile Call which is diverted in respect of the period before that call is answered.

MD4.8 Notwithstanding (and without prejudice to the generality of) the obligation imposed on the Dominant Provider by paragraph MD4.1 above:

(a) if the Dominant Provider has failed to secure that the Average Interconnection Charge has not exceeded the Target Average Charge for the First Relevant Year, the Dominant Provider shall make such adjustments to its Mobile-to-Mobile Interconnection Charges and by such day in the Second Relevant Year as Ofcom may direct for the purpose of remedying that failure. Such adjustments in the Second Relevant Year shall not be relevant for the purpose of establishing compliance with paragraph MD4.1 above in that Relevant Year;

and

(b) if it appears to Ofcom that the Dominant Provider is likely to fail to secure that the Average Interconnection Charge for the Second Relevant Year does not exceed the Target Average Charge for that Year, the Dominant

Provider shall make such adjustments to its Mobile-to-Mobile Interconnection Charges and by such day in that Year as Ofcom may direct for the purpose of avoiding that failure.

MD4.9 Where the Average Interconnection Charge is less than the Target Average Charge for the First Relevant Year, the Dominant Provider shall not make such adjustments to its Mobile-to-Mobile Interconnection Charges in the Second Relevant Year to recover the difference between the Average Interconnection Charge and the Target Average Charge for the First Relevant Year, unless Ofcom have given their prior written consent to such adjustments. Such adjustments in the Second Relevant Year shall not be relevant for the purpose of establishing compliance with paragraph MD4.1 in that Relevant Year.

MD4.10 In this Condition:

‘**Average Interconnection Charge**’ has the meaning given to it in paragraph MD4.2;

‘**Average Revenue**’ has the meaning given to it in paragraph MD4.5;

‘**Target Average Charge**’ shall have the meaning given to it in paragraph MD4.4; and

‘**Weights Adjustment Factor**’ has the meaning given to it in paragraph MD4.5.

Condition MD5 – Requirement to publish Access Contracts

MD5.1 Except in so far as Ofcom may otherwise consent in writing, the Dominant Provider shall publish its Access Contracts and act in the manner set out below.

MD5.2 The Dominant Provider shall, within 28 days of the date that this Condition comes into force, send to Ofcom its existing Access Contracts.

MD5.3 Without prejudice to Condition MD6, the Dominant Provider shall send to Ofcom any amendments to its existing Access Contracts and any new Access Contracts within 28 days of the date on which those amendments, or new Access Contracts, come into force.

Condition MD6 – Requirement to notify charges

MD6.1 Except in so far as Ofcom may otherwise consent in writing, the Dominant Provider shall publish charges and act in the manner set out below.

MD6.2 Save as is otherwise provided in paragraph MD6.5, the Dominant Provider shall send to Ofcom and to every person with which it has entered into an Access Contract a written notice of any amendment to the charges on which it provides Network Access or in relation to any charges for new Network Access (an "Access Charge Change Notice") not less than 28 days before any such amendment comes into effect.

MD6.3 The Dominant Provider shall ensure that an Access Charge Change Notice includes:

a. a description of, and the proposed new charge for the Network Access in question;

b. where applicable, the current charge for the Network Access in question; and

c. the date on which or the period for which any amendments to charges will take effect (the "effective date").

MD6.4 The Dominant Provider shall not apply any new charge identified in an Access Charge Change Notice before the effective date.

MD6.5 The Dominant Provider shall send to Ofcom and to every person with which it has entered into an Access Contract a written notice of the charges which will be in effect on 1 September 2004 on which the Dominant Provider provides Network Access no later than 28 days after the date this Condition comes into force.

Annex B

Cost of capital

Introduction

B.1 Ofcom set out its proposals and reasons for those proposals for cost of capital issues in Annex E of the December consultation. As explained in paragraphs E.1 and E.2 of that document, there are a variety of methods for estimating a firm's cost of capital. It is usually calculated as a weighted average of the firm's costs of debt and equity finance.

B.2 The cost of capital can be expressed in real terms (after adjusting for inflation) or nominal terms. It can also be expressed in post or pre-tax terms. A pre-tax cost of capital should be compared with returns calculated on a pre-tax basis and a post-tax cost of capital with post-tax returns. In the context of calculating a charge control for mobile termination, Ofcom has relied on an estimate of the MNOs' pre-tax real cost of capital.

B.3 The following sections deal with responses to the December consultation on the issues set out in Annex E of that document.

B.4 Only one of the MNOs, T-Mobile, provided a response that specifically discussed the cost of capital following the December consultation (although other MNOs had made submissions earlier in the consultation process). The following sections outline Ofcom's views on the comments made by T-Mobile[40].

Asset pricing models

Introduction

B.5 In paragraphs E.3-E.10 of the December consultation Ofcom explained its reasoning for using the Capital Asset Pricing Model (CAPM) to estimate the cost of capital for the MNOs.

B.6 A number of different asset pricing models exist for calculating the cost of capital. The Capital Asset Pricing Model (CAPM), which is a single factor model, measures economy-wide influences through the risk of an individual asset relative to a market portfolio. There are also multifactor models which include factors that capture the risk of other economic factors not captured in the single factor model. These factors can be thought of as representing special portfolios of stocks that are subject to a common influence.[41]

B.7 The CAPM has a clear theoretical foundation and is simple to implement in comparison to other asset pricing models. This results in the continued wide use of the CAPM by the UK's economic regulators, and its wide use amongst

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[40] See *Oftel's December 2003 Mobile Termination Proposals – T-Mobile's Response: Part II – Detailed Appraisal Of Economic Errors In Oftel's Analysis And Approach*

[41] This description largely comes from Brealey and Myers, Principles of Corporate Finance, Seventh Edition, page 206.

practitioners. Ofcom used the CAPM to estimate the cost of capital for the MNOs in all of its consultations on mobile termination.

Responses

B.8 In response to the December consultation, T-Mobile questioned the use of the CAPM, its response stating that it, as previously outlined in its response to the May consultation, considered the use of an Arbitrage Pricing Theory (APT) based model to be a superior approach to the CAPM.

B.9 Specifically, T-Mobile criticised the quoting of an independent study that advocated the continued use of the CAPM. This report, *A Study into Certain Aspects of the Cost of Capital for Regulated Utilities in the UK,* was carried out on behalf of Ofcom and the UK's other economic regulators by Stephen Wright, Robin Mason, and David Miles ("WM&M"), and published in February 2003 (http://www.ofcom.org.uk/static/archive/oftel/publications/pricing/2003/cofk0203.htm) (the "WM&M report").

B.10 T-Mobile stated that Ofcom's reliance on the findings of the Wright, Mason, and Miles report was misplaced since:

- T-Mobile had made a further submission, in July 2003, which had been, "made in light of the Wright, Mason and Miles paper"; and
- The analysis carried out by Wright et al did not include an appraisal of the quantitative analysis carried out on behalf of T-Mobile in 2002.

Ofcom's view

B.11 Ofcom has considered T-Mobile's response and has decided to continue to use the CAPM in line with the proposals and justification set out in paragraphs E.11 to E.15 of the December consultation. The text below addresses the additional concerns raised by T-Mobile.

B.12 Ofcom appreciates that the WM&M report was published prior to T-Mobile's July 2003 submission. However, Ofcom does not accept that its continued reliance on the WM&M report (together with other considerations) was misplaced, for the reasons set out below.

B.13 In forming an independent view on the appropriate estimation methods on behalf of the economic regulators, WM&M conducted a wide-ranging literature review. The new text provided by T-Mobile in July 2003 was based on summaries of the findings of a number of pieces of academic literature on this subject. This literature was either available to, or used by, WM&M in producing their report. For example, the literature quoted from Merton (1973), Ross (1976), and Fama and French (1993) were all used as references by WM&M. Whilst not referring to the specific articles quoted by T-Mobile, WM&M also cited a number of articles written by Cochrane and Lettau & Ludvigson, authors whose 1999 work was quoted by T-Mobile. The 2000 and 2002 work by Liew and Vassalou was available to WM&M, even though it was not referred to in their study. WM&M also drew on a range of other sources. The difficulties of applicability are picked up in one widely used and respected textbook, Brealey and Myers (Seventh Edition), who state that, "Arbitrage pricing theory doesn't tell us what the underlying factors are – unlike the capital asset pricing model, which collapses all macroeconomic risks into a well-defined single factor, the return on the market portfolio" (page 206).

B.14 Similarly, WM&M were aware of the outputs of the quantitative analysis carried out on behalf of T-Mobile in 2002 in forming their independent opinion of the relative merits of different asset pricing models. While they had not carried out a detailed appraisal of T-Mobile's methodology (e.g. they did not attempt to reproduce the results of the quantitative analysis carried out on behalf of T-Mobile), the authors were aware of its content, for example explicitly citing the broad similarity of some of the results obtained by CRA on behalf of T-Mobile to those of similar work carried out by Fama & French in the 1990s.

B.15 For the reasons set out in paragraphs E.3 and E.10 of the December consultation and the reasons set out above, Ofcom's view remains that the CAPM represents the most appropriate available model to be used in estimating the WACC of the MNOs. This view is supported by the continued use of the CAPM by the CC and the UK's economic regulators, most recently by OFGEM in March 2004. At present no compelling evidence exists which would change Ofcom's mind on this issue. Departing from the use of the CAPM would represent a significant regulatory precedent in the UK, and Ofcom would need to be thoroughly and independently convinced about the validity of any new approach before doing so. However, Ofcom is open-minded on this issue, and intends to review new evidence in this area as it becomes available.

Equity risk premium

Introduction

B.16 The equity risk premium measures the difference between the overall return on equities and the nominal risk free rate. Its value in the UK reflects the risk of investing in UK equities generally. In paragraph E.28 of the December consultation, Ofcom explained that it proposed to use an equity risk premium of 5%, based on the view that such a value would represent an appropriate, conservative, estimate from within a range of plausible estimates. The reasons for that view were set out in paragraphs E.30-E.38.

Responses

B.17 T-Mobile suggested that a value of 5% for the equity risk premium would be too low, advocating instead the use of a value of 5.9%, based on a figure calculated in a recent journal article published by Dimson, Marsh, and Staunton (Dimson, Elroy, Paul Marsh and Mike Staunton, Global Evidence on the Equity Risk Premium, Journal of Applied Corporate Finance, Volume 15, Number 4, Fall 2003).

Ofcom's view

B.18 As explained in paragraph E.30 of the December consultation, there is considerable debate about the appropriate method of calculating the value of the equity risk premium and the calculation is problematic because different methods produce different values. In particular, methods based on an analysis of current market expectations tend to give lower values than those based on analysis of historical estimates from stock market data. But determining current market expectation is a difficult and controversial task.

B.19 There are a large number of possible approaches to estimating the equity risk premium, and a wide range of estimates are available for the UK and, especially, the US.

B.20 The value of 5.9% advocated by T-Mobile appears to be based on the suggestion that a very high weight should be given to a single type of estimate, specifically one based on extrapolating the arithmetic mean of historical returns. This means that a very low weight is given to all other estimates, including those based on forward-looking estimates (as used by the UK's other economic regulators), on survey-based estimates, and on extrapolating the geometric mean of historical returns (see WM&M for a discussion of the relative merits of estimates based on geometric and arithmetic means). Another factor to consider is that, as outlined by Dimson, Marsh, and Staunton in their 2003 article cited by T-Mobile, there are strong reasons to suggest that historical estimates such as their figure of 5.9%, (which is the historical average adjusted downwards to reflect the impact of re-rating), should be subject to further downwards adjustments if it is intended to be used as an expected risk premium. Dimson, Marsh, and Staunton conclude,

"Further adjustments should almost certainly be made to historical risk premiums to reflect long-term changes in capital market conditions. Since, in most countries, corporate cash flows historically exceeded investor expectations, a further downward adjustment to the equity risk premium is in order..."

B.21 In this context, despite (and as highlighted by T-Mobile in its recent response) the investment imperative in mobile communications and consequent need for Ofcom to err on the side of conservative, i.e. high estimates, Ofcom's view is that T-Mobile's suggested value is, while within a reasonable range of possible estimates, very close to the upper limit of such a range. This view is shared by, Professor Julian Franks of London Business School who has advised Ofcom on this issue.

B.22 As explained in the December consultation paragraphs E.37 and E.38, Professor Franks' view was that Ofcom should review the use of its estimate in light of evidence recently made available. Consequently, in 2004 Ofcom has begun to review a number of different approaches to the estimation of the equity risk premium. However, given that the rationale behind the use of a figure of 5% has been consulted on in the context of mobile termination on a number of occasions, and, that the figure is well within (albeit towards the upper end of) the range implied by the submissions of the MNOs to the December consultation and previously (which have been higher in certain cases) and the ranges used by the CC and other economic regulators (which are all considerably lower), Ofcom's view is that, in the context of the proposed charge control, the use of the figure of 5% remains appropriate.

Risk free rate

Introduction

B.23 As explained in paragraph E.16 of the December consultation, Ofcom proposed a value of 5% for the risk free rate. Ofcom explained its reasons for doing so in paragraphs E.19-E.27.

B.24 The risk free rate of interest is an input into the calculation of both the cost of debt and the cost of equity. For an investment to be truly free of risk, the risk of default needs to be zero, and additionally there must be no reinvestment risk. The first condition can be satisfied approximately by using the yields on UK government debt, where the risk of default can be taken to be negligible. Strictly speaking, to satisfy the second condition, risk free rates should be estimated based on a series of short run risk free investments. This second condition is difficult to satisfy in practice, meaning that the nominal risk free rate is usually proxied by the yield on fixed term government debt of certain maturity. There is a range of maturities on government debt that could be used as the basis for an estimate of the risk free rate. These maturities range from less than 1 year to over 30 years.

B.25 There are arguments in favour of both short and long-term gilts as the best estimate of the risk free rate for the purposes of this market review. Ofcom's estimate was based on the nominal risk free rate for 5-year gilts in November 2003. The average rate at this time was 4.9%. As explained in the December consultation, this figure was rounded up to 5.0% (see paragraph E.25).

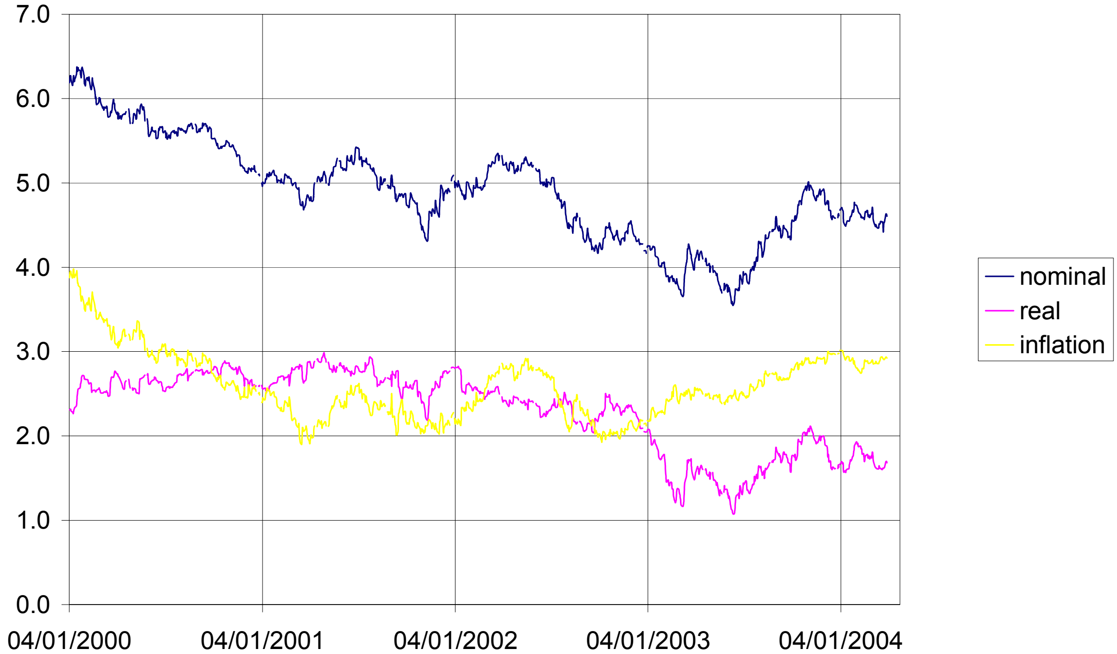
Responses

B.26 None of the MNOs commented on the value proposed in the December consultation.

Ofcom's view

B.27 Ofcom's view is that the approach used in the December consultation is appropriate. However, it proposes to review the value used in order to reflect more recent data on gilt rates. The chart below shows the trend in nominal and real gilt rates since the beginning of January 2000, together with an approximate implied inflation rate calculated by the Bank of England.

Figure 1 – Real and nominal gilt rates since January 2004



B.28 The data underpinning the chart above shows the following:

- the average nominal gilt rate between the beginning of 2000 and the end of the first quarter of 2004 (i.e. the end of March) has been 4.90% (maximum = 6.4%, minimum = 3.5%);

- the average nominal gilt rate between the beginning of 2001 and the end of Q1 2004 has been 4.65% (maximum = 5.4%, minimum = 3.5%);

- the average nominal gilt rate between the beginning of 2002 and the end of Q1 2004 has been 4.23% (maximum = 5.0%, minimum = 3.5%);

- the average nominal gilt rate between the beginning of 2003 and the end of Q1 2004 has been 4.30% (maximum = 5.0%, minimum = 3.5%); and

- the average nominal gilt rate between the beginning of 2004 and the end of Q1 2004 has been 4.60% (maximum = 4.77%, minimum = 4.42%).

B.29 The above data shows that gilt rates are subject to considerable degrees of fluctuation. Ofcom's view is that an average of 4.65%, observed between the beginning of January 2004 and the end of April 2004 makes use of up-to-date information whilst also using a long enough sample period to avoid taking account of very short run fluctuations.

B.30 It could be argued that interest rates calculated from government securities currently provide too low a benchmark for a risk free investment due to factors such as, notably, recent strong demand from pension funds. This might suggest that the risk free rate should be calculated with reference to redemption yields over a longer historical period of time as well as current spot rates. Such techniques tend to give rise to slightly higher estimates than those based on current returns (as described in, for example, the CC report).

B.31 With both of these factors in mind, Ofcom has decided to round up the average figure of 4.65% to the end of April 2004, referred to above, to **4.75%**. The use of this value reflects any ambiguity as to the appropriate bond maturity to use (e.g. it might be argued that longer values than 5 years would be appropriate). This figure is lower than the value of 5.0% used in the December consultation, this higher value being based on the high nominal gilt rates observed in November 2003.

Equity beta

Introduction

B.32 The value of a company's equity beta measures the movements in return from its shares relative to the movement in the return from the equity market as a whole. It will rise with an operator's debt/equity ratio (gearing), since a higher level of gearing implies higher volatility in the returns to shareholders.

B.33 In the May and December consultations, a range of 1.0 to 1.6 at 10% gearing was used as a value for the equity beta of an MNO (see paragraphs E.39-E.76 of the December consultation for Ofcom's reasoning). These values are the same as those used by the CC in its inquiry into mobile termination. The rationale behind the use of this range was outlined in some detail (based on analysis carried out by The Brattle Group) in the December consultation. It was noted that Ofcom had erred on the side of caution in doing so in view of uncertainty involved as to which of the estimates is most appropriate to use for the charge control (see paragraphs E.72 and E.73 of the December consultation).

Responses

B.34 In 2002 and 2003, T-Mobile made submissions to both the CC and Ofcom, advocating the use of higher beta estimates than those that were finally used by Ofcom and the CC. These higher estimates were based on using both data sets and methodologies that differed to some extent from those used in the December consultation.

B.35 In its response to the December consultation, T-Mobile focused its main criticism of the beta estimates on three broad areas of the approach that had been advocated on the basis of the recommendations of The Brattle Group. These areas related to:

- the treatment of Vodafone's foreign operations;
- the length of data windows for beta estimation; and
- Ofcom's reliance on estimates calculated using Dimson adjustments.

B.36 Ofcom's view on beta estimation in the context of each of these criticisms is outlined below. This view is based on supporting analysis carried out by The Brattle Group in April 2004, *Review of CRA submission concerning "Issues In Beta Estimation For UK Mobile Operators: Update, December 2003*," April 2004.

Ofcom's view

B.37 The first of T-Mobile's criticisms concerns the failure of Ofcom and The Brattle Group to make upwards adjustments to raw beta estimates based on Vodafone's foreign operations. Ofcom does not agree with these criticisms of its approach. In the December consultation Ofcom placed a significantly higher weight on beta estimates for O2 than on estimates for Vodafone, since using O2 data is likely to largely remove the need to use a potentially controversial adjustment in order to model the impact of overseas holdings. This preference for estimates based on O2 rather than Vodafone data was suggested in the December consultation, e.g. in paragraph E.60.

The issue of foreign operations may suggest that O2 data is more suitable for this exercise than Vodafone data

B.38 The CC followed a similar approach, as indicated in paragraph 7.241 of the CC report,

"In order to avoid the difficulties caused by overseas ownership, our upper estimate of beta is based on mmO2 and not Vodafone."

B.39 Ofcom's conclusion is that relying on O2 data is the most appropriate approach to beta estimation.

B.40 T-Mobile's second criticism of the beta estimates relied upon in the December consultation was that it gave significant weight to estimates calculated based on what T-Mobile viewed as insufficiently long time horizons. This approach followed the recommendation of The Brattle Group that the most appropriate approach to estimation was to make calculations using a single year's worth of data rather than three year's worth of data as used by T-Mobile.

B.41 Ofcom continues to share the view of The Brattle Group that, while recognising that using longer data windows can have statistical benefits, the recent instability over time of equity betas has been such that, from an economic point of view, it is inappropriate to use beta estimates that rely on longer data windows. It might be appropriate to do so if, for example, the statistical gains from using longer data windows were very great relative to the losses caused by making estimates based on data sets that encompass significant structural "breaks". But Ofcom is not persuaded that this is the case based on current data for the MNOs.

B.42 Further analysis carried out on Ofcom's behalf by The Brattle Group in April 2004 (see above for reference) suggests that, for the MNOs, the statistical gains inherent in using longer data windows are insufficient to outweigh the significant associated problems of beta instability. Results of Chow Tests carried out by The Brattle Group suggest that using longer data windows such as those advocated by T-Mobile runs a risk of undermining the validity of estimates. Ofcom's view is therefore that, in terms of length of data window, the estimates recommended by The Brattle Group are likely to form a more appropriate basis for estimation that those advocated by T-Mobile.

B.43 T-Mobile's third criticism of the beta estimations relied upon in the December consultation concerns giving weight to beta estimates calculated using Dimson adjustments. It argues that these adjustments were not statistically significant in the period shortly after the sample used by The Brattle Group. Ofcom's view is that giving weight to Dimson adjusted betas was valid given the data available to The Brattle Group at the time of estimation. The subsequent analysis carried out on Ofcom's behalf by The Brattle Group in April 2004 supports the view that its initial estimation method was robust. The Brattle Group's analysis shows that:

- Dimson adjustments were significant for the great majority of the sample period available to The Brattle Group in calculating beta estimates to support the December consultation; and

- while Dimson adjustments may not be consistently significant when beta estimates are made with a newer data set, the corresponding unadjusted beta estimates are substantially lower than the Dimson adjusted betas referred to in the December consultation (e.g. The Brattle Group estimates an unadjusted beta for O2 at 31December 2003 of 1.26. At this time O2's gearing level was estimated by The Brattle Group to be above the 30% level corresponding to Ofcom's "high gearing" scenario for which an average beta estimate of 1.6 has been used).

B.44 In the light of the above factors, and the reasons set out in the December consultation at paragraphs E.39-E.76, Ofcom's view is that an equity beta range of 1.0 to 1.6 at 10% gearing remains appropriate.

Debt premium

Introduction

B.45 The cost of corporate debt is made up of a risk free component and a company specific risk premium. Historical evidence suggests that blue chip corporate debt, such as that of mobile operators, commands a small risk premium, although estimates of this premium vary considerably.

B.46 In the May and December consultations, a range of 1% to 3.5% was used as an estimate of the debt premium of an MNO (see paragraph E.77 of the December consultation).

Responses

B.47 None of the MNOs commented on the range proposed in the December consultation.

Ofcom's view

B.48 For the reasons set out in paragraphs E.79-E.85 of the December consultation, Ofcom will continue to use the range of 1% to 3.5% for the debt premium.

Optimal gearing

Introduction

B.49 Under the standard Capital Asset Pricing Model and the Modigliani and Miller assumptions of debt and taxes, a firm can potentially lower its overall cost of capital by increasing its gearing. This is because debt is generally cheaper than equity as a result of tax advantages to debt.

B.50 In the May and December consultations, a range of 10% to 30% was used as an estimate of the gearing ratio of an MNO (see paragraph E.86 of the December consultation).

Responses

B.51 None of the MNOs commented on the range proposed in the December consultation.

Ofcom's view

B.52 For the reasons set out in paragraphs E.88-E.90 of the December consultation, Ofcom proposes to continue to use the range of 10% to 30% for the optimal gearing of a UK MNO.

Calculation of WACC – correct transformation from nominal to real

Introduction/responses

B.53 Under the heading, "Correct transformation from nominal to real" in Annex B of its response to the December consultation, T-Mobile discussed the correct way to transform nominal WACC estimates into real estimates.

Ofcom's view

B.54 Ofcom fully agrees with the need for consistency between its real/nominal WACC transformation and the values used in setting the charge control. With this in mind, Ofcom's preferred approach is to:

- calculate, using a geometric formula (see below for explanation), the rate of inflation based on the difference between nominal and real gilt yields. Data on both of these yields is supplied by the Bank of England. In the context of this calculation, the nominal risk free rate for 5-year gilts in period from the beginning of January to the end April 2004 ranged from 4.5% to 4.9%, with an average of 4.65%. This rate compares with an average real rate of return of 1.8% for similar term index-linked gilts. This difference between the real and nominal rate implies an inflation rate of approximately 2.8%; and

- use this inferred rate of inflation as an input into further calculations.

B.55 Ofcom has calculated a rate of inflation based on the formula shown below (using the notation supplied by T-Mobile in its response to the December consultation):

$$i_{\inf lation} = \frac{1 + r_{gilt}}{1 + r_{index-linked}} - 1$$

B.56 In the December consultation, the preferred approach was to use an inflation rate calculated as above to transform its calculated nominal WACC to a real WACC using the following formula (using the notation supplied by T-Mobile in its response to the December consultation):

$$WACC_{real} = \frac{1 + WACC_{no\min al}}{1 + i_{\inf lation}} - 1$$

B.57 In its response T-Mobile states that the use of the above formula in translating a nominal WACC into real terms is incorrect. It states that the correct translation is to use the following "arithmetic" transformation (as opposed to the "geometric" transformation above):

$$WACC_{real} = WACC_{no\min al} - i_{\inf lation}$$

B.58 Its preference for this arithmetic transformation is justified by means of a worked example.

B.59 Ofcom's view is that, provided that the inflation estimate has been calculated correctly, the transformation originally used in the December consultation is appropriate. This formula is repeated below:

$$WACC_{real} = \frac{1 + WACC_{no\min al}}{1 + i_{\inf lation}} - 1$$

B.60 This formula is widely used, e.g. by the CC in the CC report. An equivalent formula is given in Brealey & Myers Principles of Corporate Finance (7th

Edition, page 122), in relation to calculating a real rate of return given a nominal rate of return, as shown below:

$$1 + r_{nominal} = (1 + r_{real}).(1 + \inf lation)$$

B.61 Brealey and Myers note the real discount rate, when calculated using an arithmetic transformation, is close, but not equal, to the true real discount rate:

"Note that the real discount rate is approximately equal to the difference between the nominal discount rate of 15% and the inflation rate of 10%. Discounting at 15%-10% = 5% would give NPV… not exactly right, but close."

B.62 The following short example illustrates why Ofcom believes that the geometric transformation is appropriate. Suppose that the real WACC, *r*, i.e. the real return demanded by investors was 10%, and the inflation rate, *i*, was 50%. At the end of every given period, by which time the general price level would be at (1+*i*) times its level at the start of the period, investors would demand a return on every unit of their investment that would compensate them for both:

- for the decline in the real value of their initial investment, which, absent any returns would decline on an annual basis at the rate *i*; and

- the opportunity cost of their investment. The compensation they would require for this, if paid at the end of the period, would have to reflect the new (higher) general price level prevailing at this time.

B.63 Using the example figures quoted in the previous paragraph, using an arithmetic transformation would make the investor's nominal compensation equal to *r* + *i* = 60%, whereas a geometric transformation would make it equal to (1+*i*)(1+*r*) -1 = 65%. The difference between the two terms, *ri*, is equal to 5% in this example. Without being compensated for this extra term, as explained above, the real value of the return received by the investor to reflect the opportunity cost of his investment would have been partially eroded by inflation.

B.64 Ofcom is not convinced that T-Mobile's numerical example provides a sound justification for using an arithmetic formula. Ofcom's view is that T-Mobile's numerical example is flawed. This view is explained below:

- In T-Mobile's example, in both the nominal and real cases, it discounts the recurring cash inflows in year *t* using a discount factor calculated based on the formula D_t = 1/(1+*d*)^*t.* This suggests that the recurring cash inflows in year *t* occur at the end of year *t;* but;

- this appears to be inconsistent with the amount of inflation applied to the recurring cash inflows in the nominal case, which is set equal to I_t = (1+*i*)^(*t*-*1).* This application of inflation suggests that the recurring cash inflows in year *t* occur at the beginning of year *t,* which is inconsistent with the way in which the recurring cash flows are discounted as indicated in the previous bullet.

B.65 If this inconsistency is removed, the result obtained by T-Mobile (i.e. that the arithmetic transformation is superior) does not hold when its example is re-calculated in an internally consistent manner. In the light of this, and the widespread use of the "geometric" transformation as outlined above, Ofcom proposes to use the “geometric” transformation between nominal and real WACC as set out in the December consultation.

Calculation of WACC – consistency of values

Introduction/responses

B.66 Under the heading, “Inconsistent values in the table” in Annex B of its response to the December consultation, T-Mobile drew Ofcom’s attention to some unexplained values in Table 5 of Annex E in the December consultation.

Ofcom’s view

B.67 The reason for the significant discrepancy between the figures calculated by T-Mobile and those in the December consultation is that T-Mobile assumed a zero beta of debt, whereas Ofcom did not, as outlined in paragraph E.84. This paragraph stated that Ofcom’s estimates were based on beta of debt of zero for the first one percent of the debt premium and increasing by 0.2 for every one percent of debt premium above one percent. The debt beta measures the systematic risk of the returns on debt. Ofcom’s estimate of the debt beta implies that the first one percent of premium on mobile operators’ debt is due to factors not priced into the CAPM, for example liquidity. Any increase in debt premium beyond that level is attributed to the risk of default.

B.68 The figures below show the difference in estimates calculated using a zero debt beta, and those calculated using the “threshold” formula referred to above.

Table 1: WACC calculation assuming zero debt beta (e.g. T-Mobile)

	Low Gearing		***High Gearing***	
	Low Beta	High Beta	Low Beta	High Beta
Risk-free	5.00	5.00	5.00	5.00
ERP	5.00	5.00	5.00	5.00
Equity beta for low gearing	1.00	1.60		
Debt beta	0.00	0.00	0.00	0.00
Asset beta	0.90	1.44	0.90	1.44
Equity beta	1.00	1.60	1.29	2.06
Cost of equity (post tax)	10.00	13.00	11.43	15.29
Debt premium	1.00	3.50	1.00	3.50
Cost of debt (pre tax)	6.00	8.50	6.00	8.50
Corporate tax rate	30%	30%	30%	30%
Cost of debt (post tax)	4.20	5.95	4.20	5.95
Gearing	10%	10%	30%	30%
WACC (post tax)	9.42%	12.30%	9.26%	12.49%
WACC (pre tax)	13.46%	17.56%	13.23%	17.84%
Inflation assumption	2.8%	2.8%	2.8%	2.8%
WACC (pre tax - real)	10.33%	14.33%	10.11%	14.59%
Average WACC (pre tax – real)	**12.349%**			

Table 2: WACC calculation assuming nonzero debt beta (e.g. Ofcom)

	Low Gearing		***High Gearing***	
	Low Beta	High Beta	Low Beta	High Beta
Risk-free	5.00	5.00	5.00	5.00
ERP	5.00	5.00	5.00	5.00
Equity beta for low gearing	1.00	1.60		
Debt beta	0.00	0.50	0.00	0.50
Asset beta	0.90	1.49	0.90	1.49
Equity beta	1.00	1.60	1.29	1.91
Cost of equity (post tax)	10.00	13.00	11.43	14.57
Debt premium	1.00	3.50	1.00	3.50
Cost of debt (pre tax)	6.00	8.50	6.00	8.50
Corporate tax rate	30%	30%	30%	30%
Cost of debt (post tax)	4.20	5.95	4.20	5.95
Gearing	10%	10%	30%	30%
WACC (post tax)	9.42%	12.30%	9.26%	11.99%
WACC (pre tax)	13.46%	17.56%	13.23%	17.12%
Inflation assumption	2.8%	2.8%	2.8%	2.8%
WACC (pre tax - real)	10.33%	14.33%	10.11%	13.89%
Average WACC (pre tax – real)	**12.217%**			

B.69 As shown in Tables 1 and 2 above, the difference between WACC estimates calculated using a zero debt beta & using a nonzero debt beta may be significant. As outlined in the section on debt premium, Ofcom will use the December consultation estimates in the context of the MNOs' cost of debt. Ofcom has calculated the WACC of the MNOs using both a zero debt beta and obtained results that are broadly similar – the average real pre-tax WACC calculated using a zero debt beta is 11.89%, whereas the corresponding figure assuming that the debt beta is nonzero, and calculated based on a threshold as set out in the December consultation is 12.03%. With this in mind, Ofcom's view is that using a rounded figure of 12.0% is reasonable, and the value of the debt beta is not a critical issue. Were this value to have a more significant impact on results then Ofcom would consider the issue more closely.

WACC- conclusion

B.70 Table 3 below shows Ofcom's estimate of the real pre-tax WACC of the MNOs. As outlined above, Ofcom proposes to use a rounded average of 12.0% as a basis for the proposed charge control. This average is lower than the value of 12.25% used in the December consultation because of the use of new data on the risk free rate, showing lower yields in 2004 than had been observed by Ofcom in November 2003. As discussed above, some of the values in the table below would differ slightly if an alternative assumption regarding the beta of debt were to be used (e.g. if, as assumed by T-Mobile in its calculations, that it were zero), but this would not alter Ofcom's chosen rounded average of **12.0%** for the real pre-tax WACC.

Table 3: WACC calculation

	Low Gearing		***High Gearing***	
	Low Beta	High Beta	Low Beta	High Beta
Risk-free	4.75	4.75	4.75	4.75
ERP	5.00	5.00	5.00	5.00
Equity beta for low gearing	1.00	1.60		
Debt beta	0.00	0.50	0.00	0.50
Asset beta	0.90	1.49	0.90	1.49
Equity beta	1.00	1.60	1.29	1.91
Cost of equity (post tax)	9.75	12.75	11.18	14.32
Debt premium	1.00	3.50	1.00	3.50
Cost of debt (pre tax)	5.75	8.25	5.75	8.25
Corporate tax rate	30%	30%	30%	30%
Cost of debt (post tax)	4.03	5.78	4.03	5.78
Gearing	10%	10%	30%	30%
WACC (post tax)	9.18%	12.05%	9.03%	11.76%
WACC (pre tax)	13.11%	17.22%	12.90%	16.80%
Inflation assumption	2.8%	2.8%	2.8%	2.8%
WACC (pre tax - real)	9.99%	13.99%	9.79%	13.58%
Average WACC (pre tax – real)	**11.891%**			

Annex C

LRIC+ target charge

Use of LRIC as the cost base

C.1 As stated in Annex E of the May consultation and Annex F of the December consultation, Ofcom's view is that the most appropriate and economically efficient basis for regulatory charge controls is forward-looking LRIC. The LRIC of voice termination is the additional cost an MNO incurs to provide termination. This can also be seen as the cost that the firm would avoid if it decided not to provide voice termination, taking a long-run perspective. It corresponds more closely to the charges that would prevail in an effectively competitive market than accounting-based measures of cost. It is a fundamental goal of price regulation to mimic the effects of a competitive market and this consideration underpins the use of LRIC.

C.2 LRIC is widely used as a regulatory costing technique, for example by other NRAs in Europe such as the PTS in Sweden, and by the FCC in the US. It has also been identified as the most appropriate methodology to use for setting interconnection charges by the European Commission in its 1998 Recommendation on Interconnection. For further details, see The Use of Long Run Incremental Cost (LRIC) as a Costing Methodology in Regulation, 12 February 2002, http://www.ofcom.org.uk/static/archive/oftel/publications/mobile/ctm_2002/lric120202.pdf. Furthermore, the CC has agreed, as stated in paragraph 2.251 of the CC report, with the use of LRIC as the appropriate costing methodology for setting termination charges.

C.3 Ofcom's view remains unchanged that the only relevant costs for the purposes of setting the charge controls are those relevant to 2G voice termination. This excludes 3G costs which the MNOs can recover through their unregulated 3G charges. The CC took the same view on this issue as stated in paragraph 2.251 of the CC report.

LRIC model

C.4 The purpose of the LRIC model is to derive the costs of a reasonably efficient 2G mobile operator in the UK. In April 2002, the latest version of the model was made available which considered a voice-only network. The model and supporting documentation are available at http://www.ofcom.org.uk/static/archive/oftel/publications/mobile/ctm_2002/april02_model.zip[42]. Further detailed papers are also available: Source of algorithms, data, assumptions and estimates, http://www.ofcom.org.uk/static/archive/oftel/publications/mobile/ctm_2002/analysis300102.pdf; and Manual for the Oftel LRIC model, http://www.ofcom.org.uk/static/archive/oftel/publications/mobile/ctm_2002/slides300102.pdf. In the December consultation, some amendments were made to

[42] An updated version incorporating the changes discussed in the December consultation and in this Annex will be available shortly on Ofcom's website.

the model as a result of responses to the May consultation, as documented in paragraphs F.15-F.16, F.23-F.24, F.26-F.27 and F.31-F.35.

C.5 In designing the model, five key issues were considered as listed in the December consultation and summarised briefly in the May consultation:

- the length of the time period over which cost behaviour would be considered (see also Network Common Costs, 19 February 2002, http://www.ofcom.org.uk/static/archive/oftel/publications/mobile/ctm_2002/network_costs.pdf);
- the definition of the increment (see also Network Common Costs (referred to above) and Different Views of Oftel and MNOs on Network Common Costs, 27 May 2002, http://www.ofcom.org.uk/static/archive/oftel/publications/mobile/ctm_2002/common_cost0602.pdf);
- the definition of common costs and how these should be recovered (see also Network Common Costs, and Different Views of Oftel and MNOs on Network Common Costs (referred to above));
- the level of efficiency to be assumed; and
- the depreciation method to be used (see also Calls to mobile: economic depreciation, September 2001, http://www.ofcom.org.uk/static/archive/oftel/publications/mobile/depr0901.htm, and Additional Information Concerning Oftel's LRIC Model, 12 February 2002, http://www.ofcom.org.uk/static/archive/oftel/publications/mobile/ctm_2002/lric_more120202.pdf, and Accounting depreciation cost based estimates, 3 May 2002, http://www.ofcom.org.uk/static/archive/oftel/publications/mobile/ctm_2002/account_let0502.pdf).

C.6 In its review of the charges for calls to mobiles, the CC agreed with these general principles and that the April 2002 LRIC model was a suitable starting point for the assessment of the costs of terminating calls on mobile networks (paragraph 2.287 of the CC report).

Responses to the December consultation

LRIC model output

C.7 In the opening paragraphs of section 3.3.2 of its response to the December consultation, Orange reiterates its belief that the only way to derive reliable outputs from the LRIC model is to amend the input parameters and the underlying methodology. Ofcom believes that this point has been substantively addressed in paragraphs F.12-F.14 of the December consultation.

C.8 The remainder of this section considers the other issues raised in response to the December consultation regarding the output of the LRIC model and presents Ofcom's response.

Cost of capital

C.9 As stated in Annex D of the May consultation and Annex E of the December consultation, Ofcom believes that the appropriate cost of capital in the context of this market review is the cost of capital for a reasonably efficient 2G mobile operator in the UK, and in particular, the cost of capital regarding 2G termination services.

C.10 The model made available in April 2002 calculates the LRIC on the basis of a 12.5% pre-tax real cost of capital in 2003/04 and subsequent years. Ofcom has updated the components of the CAPM used to derive an estimate for the cost of capital in the light of more recent information. On this basis, Ofcom estimates the pre-tax real cost of capital to be in the range of 9.8% to 14.0% with a mid-point of 12%. This is a small decrease from the 12.25% proposed in the December consultation (due to a fall in the estimate of the risk free rate) and identical to the value proposed in the May consultation which were both based on the best available information at that time. Further details of the derivation of this range are provided in Annex B.

C.11 The resulting adjustment to the output from the April 2002 LRIC model, taking account of the amendments described in the December consultation, is shown in the table below with the LRIC+ figures for 2005/06 unchanged to within 1%.

Table 1: Adjustment to April 2002 LRIC model termination output (after December consultation amendments) for 12% cost of capital

Pence per minute (real 2000/01)	*2001/02*	*2002/03*	*2003/04*	*2004/05*	*2005/06*
900/1800MHz operators					
LRIC+ (12.25% CoC – Dec consultation)	5.07	4.76	4.15	3.95	3.76
LRIC+ (12% CoC)	5.09	4.78	4.12	3.92	3.73
Difference	0.02	0.02	-0.04	-0.03	-0.03
Percentage	0.4%	0.5%	-0.9%	-0.8%	-0.7%
1800MHz operators					
LRIC+ (12.25% CoC – Dec consultation)	6.26	5.85	5.03	4.75	4.50
LRIC+ (12% CoC)	6.29	5.88	4.98	4.70	4.46
Difference	0.03	0.03	-0.05	-0.05	-0.04
Percentage	0.4%	0.5%	-1.0%	-1.0%	-0.9%

Administrative fees for 2G spectrum

C.12 Ofcom is currently undertaking a review of the annual administration fees paid by MNOs for their 2G spectrum allocation. A report by Indepen, Aegis and Warwick Business School was made publicly available in February 2004 (see http://www.ofcom.org.uk/research/industry_market_research/m_i_index/spectrum_research/independent_review/?a=87101) and Ofcom is expecting to publish a document for consultation towards the end of the summer. Potentially, the review may result in a change to the 2G spectrum fees paid by MNOs within the time period of the charge control. Orange notes this issue in section 3.3.4 of its response.

C.13 The Indepen et al report reviews the application of Administered Incentive Pricing (AIP) to radio spectrum, as part of the programme of work to implement the Government's response to the Cave Review of Radio Spectrum Management. The report estimates the marginal opportunity cost of spectrum to be £1.680m for a 2x1MHz carrier in both the 900MHz and 1800MHz bands. This figure is about 2.4 and 3 times higher than the existing charges for the 900MHz and 1800MHz bands respectively. However, the report does not determine final spectrum licence charges as Ofcom will undertake that task following consultation, having also taken into consideration a range of other policy issues and objectives beyond simply that of maximising efficiency in the use of spectrum.

C.14 To derive a LRIC+ target charge for 2005/06 it is necessary to make assumptions about future spectrum pricing. One option would be to ignore Ofcom's forthcoming review, perhaps on the basis that the new charges are not yet known. But, given that Ofcom is concerned not to understate costs and that there is some indications that the administration fee may rise, Ofcom considers it preferable to set assumptions for the 2G spectrum licence charges from 1 April 2005 on the latest available information which is the marginal opportunity cost estimates provided by Indepen et al. For the avoidance of doubt, Ofcom emphasises that such an approach is not intended to, and does not, pre-judge the outcome of Ofcom's forthcoming consultation on administered incentive pricing for spectrum.

C.15 In examining this issue, Ofcom has made a correction to a minor error in the original calculation of the 2G spectrum fees presented in the April 2002 LRIC model regarding conversion of nominal charges to real 2000/01 values and also updated the 1800MHz charges for 2001/02 to 2003/04 reflecting the actual implemented charges, as this information[43] was not available when the model was first constructed. Together with the revised estimates for future 2G spectrum pricing, this results in a net amendment to the input cells C85:D135 of the Unit_cost_data sheet in the Netw_R2.xls model file which is shown in the table below for the years 2001/02 to 2005/06.

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[43] Spectrum Pricing: Year Five, A consultation document, January 2002 (Table T3) and The Wireless Telegraphy (Licence Charges) Regulations 2002 (2002 No. 1700) made 2 July 2002

Table 2: Adjustment to spectrum pricing to April 2002 LRIC model inputs for 2001/02 to 2005/06

Spectrum pricing (£ real 00/01)	***Original April 02 LRIC model***		***Revised inputs***	
Year	GSM 900	GSM 1800	GSM 900	GSM 1800
01/02	17,436,672	24,330,240	15,294,727	16,242,188
02/03	17,855,152	24,914,166	14,936,256	15,861,511
03/04	18,283,676	25,512,106	14,586,188	15,489,757
04/05	18,283,676	25,512,106	14,188,899	15,067,857
05/06	18,283,676	25,512,106	34,422,796	44,416,511

C.16 Re-calculating the model output to reflect this revision to 2G spectrum pricing results in an increase in the model's LRIC+ of termination for 2005/06 of about 0.13ppm and 0.15ppm for combined 900/1800MHz and 1800MHz operators respectively.

Table 3: Adjustment to April 2002 LRIC model termination output (after December consultation amendments) for 12% cost of capital and revision to 2G spectrum pricing

Pence per minute (real 2000/01)	***2001/02***	***2002/03***	***2003/04***	***2004/05***	***2005/06***
900/1800MHz operators					
LRIC+ (12% CoC)	5.09	4.78	4.12	3.92	3.73
LRIC+ (12% CoC / revised 2G spectrum)	4.86	4.53	3.90	3.69	3.86
Difference	-0.23	-0.25	-0.22	-0.22	0.13
Percentage	-4.4%	-5.2%	-5.3%	-5.7%	3.5%
1800MHz operators					
LRIC+ (12% CoC)	6.29	5.88	4.98	4.70	4.46
LRIC+ (12% CoC / revised 2G spectrum)	5.94	5.50	4.65	4.37	4.61
Difference	-0.35	-0.38	-0.32	-0.33	0.15
Percentage	-5.6%	-6.5%	-6.5%	-7.0%	3.4%

Treatment of equipment that declines in quantity

C.17 In paragraphs B.16-B.21 of its response, whilst Vodafone agrees that the approach regarding swapped out microwave links described in paragraph F.24 of the December consultation is reasonable, Vodafone has a greater concern regarding the treatment of equipment that declines in quantity but then recovers in later years in response to demand.

C.18 Specifically, Vodafone believes that whilst the approach described in paragraphs F.26-F.27 of the December consultation to prevent equipment quantities temporarily falling in response to reduced demand appears a plausible correction, it ignores consideration of the depth and duration of the temporary "dip" in demand. Vodafone believes that an efficient operator would not maintain surplus equipment for the duration of the dip. Rather, in Vodafone's opinion it is the initial peak requirement that is transient and a ‘quirk’ of the model's look-ahead algorithm. Vodafone proposes that a more reasonable assumption is to remove the transient peak on the basis that an efficient operator would not purchase the equipment in 1999/2000 but instead expand its network more evenly.

C.19 Vodafone correctly notes that the peak in equipment quantity requirements is in part due to the model’s look-ahead algorithm as described in paragraph F.26 of the December consultation. In reality network planning for equipment is a complex undertaking influenced by a number of factors and the model necessarily takes a simplified and more mechanistic approach. Ofcom considers that there is merit in the arguments put forward for the treatment of decline in equipment taken in the December consultation: an efficient operator may be expected to satisfy full traffic demand and, after a period of rapid growth, may not be able to accurately anticipate a significant decrease in that rate of growth, leading to a subsequent period during which equipment levels are higher than ideally necessary. However, there is also merit in Vodafone’s observation about the depth and duration of the dip in network requirements. Ofcom recognises that in reality an efficient operator may be able to manage the impact of significant changes in growth of demand to some degree thus ’smoothing’ the timing of equipment purchase and reducing the extent of under-utilisation of equipment for the period in question. The net impact of adopting Vodafone’s approach in place of that proposed in the December consultation is an increase in the LRIC+ target charge for 2005/06 of about 0.12ppm after reconciliation with the MNO data in 2001 (see paragraph C.22 below). A case can be made for either approach, but on balance, Ofcom considers it reasonable to adopt Vodafone’s amended approach to this issue in the interests of ensuring that costs are not understated.

C.20 With regards to the detailed amendments to the model, Vodafone proposes a smoothing adjustment for 3-sector cell sites and for inter-switch transmission links. However, Ofcom believes that to single out only two asset elements results in an inconsistent treatment and it is more appropriate to apply this adjustment to all asset elements which are subject to temporary decline in quantity. In particular these elements are:

- 3-sector cell sites
- 2Mbit/s backhaul microwave links
- 8Mbit/s backhaul microwave links
- BSC: BS-facing ports
- BSC: MSC-facing ports
- MSCs
- MSC: interconnect-facing ports

- MSC: switch-facing ports
- Inter-switch transmission links

C.21 The quantities of the above asset elements can be smoothed over the relevant period by overwriting the values of the network_design_full sheet of the Netw_R2.xls model file according to the table below.

Table 4: Amendments to specific modelled equipment quantities on network_design_full sheet of Netw_R2.xls – where there is no entry the model is allowed to calculate equipment quantities unmodified

Equipment asset element	*Row*	*98/99*	*99/00*	*00/01*	*01/02*	*02/03*	*03/04*
Macrocells – Urban (900)	152	-	1660	1670	1680	1690	-
Macrocells – Urban (1800)	152	-	1700	-	-	-	-
Macrocells – Suburban (900)	153	-	1340	1380	1395	1410	-
Macrocells – Suburban (1800)	153	-	1075	-	-	-	-
Macrocells – Suburban (900)	420	-	-	-	1	-	-
Macrocells – Suburban (1800)	420	-	-	-	-	-	-
Macrocells – Suburban (900)	421	-	-	-	0	-	-
Macrocells – Suburban (1800)	421	-	-	-	-	-	-
BSC: MSC ports	710	-	-	-	-	2625	2650
MSCs	727	-	-	-	-	87	-
MSC: interconnect ports	740	-	-	4400	4450	-	-
MSC: switch ports	749	-	-		7400	-	-
Inter-switch transmission links	767	-	6050	6100	6150	-	-

C.22 The impact of the amendments is a lower economic cost model output in 2005/06 due to reduced quantities of equipment, and a lower model GBV and operating cost in the reconciliation year. The lower output in the reconciliation year results in a greater upwards adjustment after comparison with the MNO data in 2001, from 35.6% to 38.7% for GBV and from -14.2%[44] to -8.5% for operating costs. This adjustment counteracts the lower economic cost model output in 2005/06 (by -0.11ppm and -0.06ppm for combined 900/1800MHz operators and 1800MHz operators respectively) so that the net impact of this change is a slight increase of about 0.12ppm in the final LRIC+ target charge for 2005/06. There is also an implication for the differential between combined

[44] This percentage differs from that published in the December consultation due to the earlier amendment to the 2G spectrum pricing in 2001/02

900/1800MHz operators and 1800MHz operators which is discussed in paragraph C.87 below.

Table 5: Adjustment to April 2002 LRIC model termination output (after December consultation amendments) for 12% cost of capital, revision to 2G spectrum pricing and revision of treatment of equipment that declines in quantity

Pence per minute (real 2000/01)	***01/02***	***02/03***	***03/04***	***04/05***	***05/06***	***GBV (£m)[45]***	***Opex (£m)[46]***
900/1800MHz operators							
LRIC+ (12% CoC / revised 2G spectrum)	4.86	4.53	3.90	3.69	3.86	1835	348
LRIC+ (12% CoC / revised 2G spectrum / revised declining assets)	4.73	4.41	3.79	3.58	3.76	1758	318
Difference	-0.13	-0.12	-0.11	-0.11	-0.11	-76	-30
Percentage	-2.7%	-2.7%	-2.9%	-3.0%	-2.7%	-4.2%	-8.5%
1800MHz operators							
LRIC+ (12% CoC / revised 2G spectrum)	5.94	5.50	4.65	4.37	4.61	1983	403
LRIC+ (12% CoC / revised 2G spectrum / revised declining assets)	5.87	5.43	4.59	4.31	4.55	1973	387
Difference	-0.07	-0.06	-0.06	-0.06	-0.06	-10	-17
Percentage	-1.1%	-1.2%	-1.3%	-1.4%	-1.3%	-0.5%	-4.2%

Asset lifetimes

C.23 In section 3.3.2.A of its response, Orange repeats its concern that the asset lifetimes used in the model are unrealistically long. In particular, Orange raises the following issues:

- the derivation of asset lifetimes within the September 01 model is superseded by direct inputs in the April 02 model;
- the sensitivity of outputs to asset lifetimes must take account of adjustments resulting from comparison with the MNOs' accounts;
- there is increased capital cost recovery associated with shorter asset lifetimes.

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[45] From HCA model in 2001/02 (real 2000/01)

[46] From HCA model in 2000/01 for 900/1800MHz operators and weighted average of 2000/01 and 2001/02 for 1800MHz operators (real 2000/01)

C.24 T-Mobile expresses similar concerns in paragraphs II.67-II.70 of its response. Additionally, T-Mobile requests further detail regarding the treatment of T-Mobile's asset lifetimes.

C.25 Neither Orange nor T-Mobile has submitted new evidence regarding this issue which was responded to previously in paragraphs F.40-F.47 of the December consultation. Ofcom therefore finds no compelling evidence to adopt a different position from that stated previously. The further, more detailed, concerns raised by these two operators are addressed below.

C.26 Whilst Orange is correct in noting that asset lifetimes are an input in the April 02 model, rather than derived as part of the economic depreciation calculation as in the September 01 model, it is incorrect to characterise this particular change as an improvement designed to address a 'flaw' in the original version of the model. The primary purpose of the later version of the model was to improve transparency of the calculations and simplify the analysis where appropriate (specifically to present a voice-only model rather than one which also models data services). As a secondary consideration, the opportunity was taken to improve the economic depreciation algorithms, and in particular, to implement an 'all-instances' calculation which explicitly considers the number of assets purchased in each year, rather than a 'single-instance' approach (see *Mobile phones inquiry: Mobile termination – re-presented cost model*, letter to CC, 8 April 2002[47]). Whilst this change makes it more difficult to calculate the asset lifetimes endogenously (hence the direct inputs for asset lifetimes in the April 02 model), it does not change the appropriate asset lifetimes which seek to recognise the trade-off between increased capital costs if assets are replaced more frequently with increased operating costs associated with older assets if they are replaced less frequently. Taking the endogenously calculated lifetimes from the September 01 model as direct inputs for the April 02 model is a pragmatic approach to respecting this trade-off in an internally consistent way.

C.27 Regarding Orange's second concern, Ofcom agrees that it is relevant to consider the impact of changes in asset lifetimes *after* comparison with the MNOs' accounts. It was noted in paragraph F.47 of the December consultation that Orange's proposed asset lifetimes did indeed result in a slightly higher economic cost of termination in 2005/06 after reconciliation with operator data, however, this was not confirmed by the results obtained using T-Mobile's asset lifetimes. As noted in paragraph F.45 of the December consultation, implementing shorter asset lifetimes has two counteracting effects: capital cost recovery is increased and operating cost recovery is reduced. Following the amendments to the model described earlier in this annex, Ofcom has recalculated the impact of different asset lifetimes based on the information previously provided by Orange and T-Mobile. In the case of T-Mobile's information the net effect is a *lower* model output for 2005/06 due to a stronger operating cost effect prevailing. Ofcom has then determined the impact *after* comparison with operator data in 2001 recognising that amending asset lifetimes has a direct impact on the capital / operating cost proportions over time as noted by Orange in section 3.3.2.B of its response (see also paragraph C.57 below). Consistent with the findings in paragraph F.47 of the December

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[47] See http://www.ofcom.org.uk/static/archive/oftel/publications/mobile/ctm_2002/letter0602.pdf

consultation, whilst one set of lifetimes leads to a slightly higher cost of termination in 2005/06, the other set leaves the efficient charge level unchanged to within about 1%. In any case, the key observation is that the reconciliation with MNOs' GBV figures is a relatively high level process and sensitive to the particular timing of asset replacement – essentially due to a modelling artefact which simplifies the nature of asset replacement. For this reason, Ofcom believes that it would be inappropriate to place too great a weight on significant changes to the results which arise solely from reconciliation with operator data following changes in asset lifetimes, which in themselves have a negligible impact on the model output (as noted in paragraphs F.44-F.46 of the December consultation).

C.28 Orange re-articulates its concern regarding capital cost recovery by providing a simple worked example. However, this example does not reflect the relevant calculation as it illustrates a point where the underlying path of capital cost recovery is simple straight-line accounting depreciation, rather than an economic depreciation calculation. Orange is correct in observing that capital costs are determined by the initial gross book value (GBV) of the asset as well as the capital recovery profile. However, Orange is incorrect in its belief that the second aspect has not been addressed. The reconciliation with operator data seeks to compare quantities of assets at appropriate prices; hence it is reasonable to consider a comparison of GBV. However, the path of cost recovery chosen to determine regulated charges (economic depreciation) is very different from that used in the operator data (accounting depreciation) for reasons discussed in paragraphs C.88-C.93 below. It would therefore be inappropriate to attempt to reconcile capital cost recovery in the model against that presented in the MNOs' accounting information. Whilst the quantity of assets is addressed through a GBV adjustment, the increased capital cost recovery associated with shorter asset lifetimes is addressed internally within the model through the economic depreciation calculation and, as described in paragraph F.44 of the December consultation, this effect is broadly balanced by the reduced operating cost recovery associated with younger assets.

C.29 In response to T-Mobile, as described in paragraph C.26 above, it is questionable whether asset lifetimes in the model should be amended without also reflecting the likelihood of faster falling modern equivalent asset (MEA) price trends and / or faster rising operating costs with age. Nevertheless, a simple sensitivity analysis is undertaken (as in the December consultation) where the lifetimes of network elements in the LRIC model are reduced in accordance with those suggested by T-Mobile (see paragraph F.44 of the December consultation). The same approach is taken with Orange's asset lifetime information. As is transparent from examination of the April 02 model (and highlighted above), asset lifetimes in the model are direct inputs and so can simply be replaced for the purpose of undertaking sensitivity analysis regarding shorter lifetimes. T-Mobile did not provide revised asset lifetimes for all network elements in the LRIC model but only for the major network elements. Hence, in undertaking the sensitivity, asset lifetimes for the remaining categories are based on the more comprehensive set of lifetimes provided by Orange, given that these lifetimes are shorter than those originally used in the April 02 model and hence more favourable to T-Mobile.

C.30 Regarding T-Mobile's final point in paragraph II.70 of its response, the sensitivity analysis involving shorter asset lifetimes still results in an upwards capital cost adjustment and a downwards operating cost adjustment. However, the key factor is not the impact of shorter asset lifetimes on the comparison with operator data in 2001 but the impact of the higher capital cost recovery and lower operating cost on the economic cost in 2005/06 which is captured within the model through the economic depreciation calculation.

Asset price trends after 2010, 3G migration and dynamic uncertainty

C.31 Vodafone (paragraphs B.29-B.33 of its response) submits that equipment prices should continue to fall after 2010, following the observed trend in the model from 1990. The only factor that Vodafone can identify for a stabilising in 2G asset prices is the emergence of 3G technology, and the subsequent diverting of manufacturers' focus on the development of 3G equipment. Vodafone asserts that whilst migration of voice traffic from 2G to 3G has been ignored, the impact of 3G on 2G MEA prices has been recognised selectively.

C.32 Following the above point, in section 3.3.1 of its response, Orange proposes that there are significant longer term uncertainties in a dynamic market and that it is inappropriate to ignore 3G considerations in the cost modelling. Orange does not believe that modelling 2G costs exclusively results in estimates which represent a ceiling on reasonable costs. Whilst acknowledging that it is potentially impossible to reflect the dynamic uncertainties accurately, Orange believes that caution should be exercised in issues of discretion and attempts should be made to model particular outcomes to provide a range of estimates.

C.33 In particular, Orange states that the Director's approach essentially assumes that MNOs will only migrate traffic from 2G to 3G when unit costs of 3G are lower than 2G and believes that this is unreasonable due to a number of exogenous factors which influence an MNO's migration including: the competitive landscape; 2G / 3G interoperability issues; and regulatory uncertainties.

C.34 T-Mobile (paragraph I.27 of its response) also argues that insufficient consideration has been given to dynamic implications, in particular, the effect on MNOs' incentives to invest in risky projects. In response to this point, Ofcom's position is clearly stated in paragraphs L.22-L.23 of the December consultation: future projects (such as 3G) should be assessed on their own merit, rather than on the basis of receiving subsidy from 2G termination charges set in excess of costs. Ofcom believes that it has given due consideration to the 2G investment made by MNOs in accordance with section 88(2) of the Act.

C.35 As stated in paragraph F.49 of the December consultation, for the purposes of regulating 2G termination charges, future voice traffic is modelled *as if* it is carried on a 2G network of a reasonably efficient operator. This scenario does not intend to negate the existence of 3G technology and its impact, nor the likelihood that in reality voice traffic will at least partially migrate to 3G networks. As to the appropriate MEA price trend, whilst it is typical for rapid reductions to occur in the unit cost of production in the early stages of a product's lifecycle due to significant increase in volume production and economies of scale, it seems optimistic to assume that prices will decline indefinitely and, in the limit, tend to zero. Over the explicitly modelled period, the model already assumes that the price of TRXs fall to 12% of their initial value. Vodafone's belief that price declines should continue after 2010 would lead to unit TRX prices that are less than 3% of the initial value by the end of the modelled period. Ofcom does not believe that it is appropriate to adopt

Vodafone's assumption and, as noted previously, this is consistent with the CC's viewpoint (paragraph 2.317 of the CC report).

C.36 It is therefore inappropriate for Orange to interpret the explicitly modelled period of 50 years as an indication that Ofcom assumes no migration to 3G will occur before 2040 or that it is an attempt to predict how the market will look in 2040. Rather, the modelling approach seeks to determine an appropriate basis for calculating the level at which to regulate 2G termination charges. This is achieved by considering a scenario where future voice traffic is modelled *as if* it is carried on a 2G network of a reasonably efficient operator.

C.37 Orange acknowledges that it is "potentially impossible" to accurately reflect dynamic uncertainties in the modelling, and instead requests that discretion should be exercised in a cautious manner to take account of these uncertainties. Ofcom believes that caution has indeed been taken to ensuring costs are not understated in a number of respects and therefore does not share Orange's concern that the resulting charge is below the floor of reasonable costs. For example, the treatment of equipment that declines in quantity (see paragraph C.19 above); the approach taken to calculating the non-network common cost mark-up (see paragraph C.116 below); the reconciliation with MNOs' accounting data in 2001 which does not make any adjustment for potential operator inefficiency at that time; and the use of economic depreciation, rather than current cost accounting, which results in a significantly higher efficient charge level (see paragraphC.92 below).

C.38 Orange believes that it would be more appropriate to model particular outcomes, including the migration of 2G services to 3G, in order to obtain a range of estimates as a basis for determining the efficient charge level. Ofcom has undertaken significant sensitivity testing in the past, however Ofcom has now focussed on a specific reasonable representation of the costs of 2G termination, based on this earlier work.

C.39 In any case, Ofcom maintains the view that the timing and rate of migration of voice traffic from 2G to 3G networks is essentially a decision to be made by operators and hence the modelling of future voice traffic as if it is carried on a 2G network is reasonable for the purposes of setting regulated 2G termination rates. Orange claims that it cannot entirely control this migration due to the competitive requirement to offer 3G services and the effectiveness of interoperability between 2G and 3G in dual coverage areas since "the handset will automatically select the 3G technology if available". Ofcom is aware that there are already handsets available which enable network selection. Furthermore, as Orange states, future 3G network equipment software releases may also address this concern. Ofcom is of the opinion that whilst there may be a transitory period in the early stages of 3G take-up during which a network operator does not have full control of the rate of migration of voice traffic, within a reasonable period the technology should enable MNOs to have sufficient control. Therefore, Ofcom believes there is insufficient evidence to suggest that Orange's concern will have a material impact.

Summary of revisions to LRIC model results

C.40 The overall impact of the amendments made to the model regarding pricing for 2G spectrum and treatment of equipment that declines in quantity is summarised in the table below.

Table 6: Summary of impact of amendments on LRIC model results

Pence per minute (real 2000/01)	***2001/02***	***2002/03***	***2003/04***	***2004/05***	***2005/06***
900/1800MHz operators					
LRIC+ (12% cost of capital)	5.09	4.78	4.12	3.92	3.73
LRIC+ (2G spectrum)	4.86	4.53	3.90	3.69	3.86
LRIC+ (2G spectrum + declining assets)	4.73	4.41	3.79	3.58	3.76
Difference	-0.36	-0.38	-0.33	-0.33	0.03
Percentage	-7.0%	-7.8%	-8.0%	-8.5%	0.7%
1800MHz operators					
LRIC+ (12% cost of capital)	6.29	5.88	4.98	4.70	4.46
LRIC+ (2G spectrum)	5.94	5.50	4.65	4.37	4.61
LRIC+ (2G spectrum + declining assets)	5.87	5.43	4.59	4.31	4.55
Difference	-0.42	-0.45	-0.39	-0.39	0.09
Percentage	-6.6%	-7.6%	-7.7%	-8.3%	2.1%

Comparison with MNO data

2001 GBV costs understated

C.41 In section 3.3.2.D of its response, Orange states that the average GBV derived from MNO data for 2001 used to compare with the LRIC model is understated due to simple averaging of T-Mobile's GBV which fails to take account of T-Mobile's subsequent network coverage investment. Specifically, Orange believes that the conclusion that T-Mobile's network has primarily been driven by improvements in quality rather than coverage (see paragraph F.95 of the December consultation) is incorrect.

C.42 Ofcom has no compelling reason to revise the position described in paragraph F.95 of the December consultation for the reasons discussed in paragraphs C.71-C.81 below. Ofcom acknowledges that *if* it accepted that T-Mobile's GBV is understated on a like-for-like basis and *if* it accepted Orange's proposed solution, the efficient charge in 2005/06 would increase by about 0.05ppm. This increase is small, and in any case, Ofcom does not accept Orange's point for the reasons set out in paragraphs C.71-C.81.

Data adjustment factor

C.43 Vodafone seeks clarification (paragraph B.22 of its response) that in deriving an average data adjustment figure of 4.5% (paragraph F.72 of the December consultation), whether O2's submission to the CC was used in this calculation.

C.44 Orange asserts in section 3.3.2.G of its response that the proposed data adjustment factor is based on the proportion of radio channels dedicated to GPRS which ignores the modularity of equipment. As raised in its previous response, Orange believes that the correct approach is to exclude the incremental costs of adding GPRS equipment to an existing GSM voice network. Further, Orange states that any concerns expressed in paragraph F.71 of differences in cost allocation methodologies is quite unfounded when referring to specific incremental costs.

C.45 Finally, Orange believes that when averaging across operators for the purpose of modelling inputs, a consistent approach should be taken across all operators to ensure the exclusion of data specific costs.

C.46 The purpose of the data adjustment factor and methods for estimating it are set out in paragraphs F.70-F.72 of the December consultation. In particular, two approaches are described. The first approach (adopted by the CC) is based on consideration of the capacity dedicated to non-voice services (see paragraph F.71 of the December consultation). The second approach is based on consideration of the incremental costs exclusively associated with data services (see paragraph F.70 of the December consultation). Ofcom believes that both approaches are a reasonable way of determining the percentage by which a total GBV figure (representing both voice and data) should be reduced to represent the GBV associated with a voice-only network. The data adjustment figure of 4.5% is based on averaging the most recent estimates received from all four MNOs (consistent with the approach taken more generally to the comparison with operator data), using the first approach in the case of O2 (information submitted to the CC), and the second approach in the case of the remaining three MNOs (who submitted further information in response to the May consultation).

C.47 Orange's assertion that the figure of 4.5% is "based on the proportion of radio channels dedicated to GPRS" is therefore not correct since this figure is primarily based on incremental costs associated with GPRS. Regarding Orange's second point that there are no allocation issues when referring to specific incremental costs, this might be a valid observation if a very narrow interpretation of the word "allocation" were taken. However, Ofcom did not intend such a narrow interpretation – paragraph F.71 of the December consultation expressed the broader point that in determining appropriate cost causality there are typically various issues in deciding exactly how to measure the increment and how to attribute costs accordingly. The key sentiment is that a capacity measure is likely to be more neutral in this respect.

C.48 Ofcom believes that the approach it has adopted of deriving an average voice-only GBV figure by calculating the average total (voice and data) GBV figure across all operators and then reducing this by an average data adjustment factor is a consistent approach to take across all operators. If Orange's final comment regarding consistency is intended as a proposal that the total (voice and data) GBV figure for each operator should be reduced by that operator's data adjustment factor to obtain a voice-only GBV figure for each operator which is then used to derive an average voice-only GBV figure, this may well be a reasonable approach. A case can be made for either approach, however, since Ofcom has rounded down the average data adjustment factor to 4.5% (see paragraph F.72 of the December consultation) in the interests of not understating costs, the resulting upwards capital cost adjustment (to be applied to the capital proportion of the 2005/06 economic cost) is essentially the same regardless of which approach is adopted[48].

Varying capital / operating cost proportions over time

C.49 In response to the proposal that a more accurate estimate of the economic cost in 2005/06 is obtained by recognising that capital / operating cost proportions vary over time (see paragraph F.80 of the December consultation), O2 (page 2), Orange (section 3.3.2.B-3.3.2.C), T-Mobile (paragraphs II.48-II.52) and Vodafone (paragraphs B.24-B.27) believe that insufficient reasoning has been given for this change. O2 states that it is not clear why the LRIC model estimates have been used rather than other empirical evidence. Orange believes that it is inconsistent to use a theoretical model to determine the proportions over time whilst applying a fixed calibration adjustment solely on outputs for 2001.

C.50 More specifically, Vodafone, T-Mobile and Orange highlight that the capital / operating cost proportions of the economic cost in 2005/06 depend on the asset lifetime assumptions, which they consider questionable.

C.51 Furthermore, Vodafone and T-Mobile question whether it is appropriate to derive capital / operating cost proportions on the basis of the split of the economic cost output from the model. Vodafone believes that this split is merely a feature of the way the economic depreciation calculation recovers cost over time and proposes that it would be more appropriate to determine the split on the basis of an accounting view of operating costs. T-Mobile appears to share similar sentiments stating that the capital and operating cost trends in the LRIC model are an artificial output of the model.

C.52 Finally, T-Mobile believes that the change in the capital / operating cost proportions is inconsistent with arguments used elsewhere that a high level comparison is more appropriate than a more detailed comparison (for example in regard to Vodafone's concern of structural bias discussed in paragraphs F.83-F.89 of the December consultation).

C.53 The purpose of the reconciliation is to establish the extent to which capital costs and operating costs are understated or overstated in the model when compared with operator data. The underlying assumption is that if capital costs are understated by *x*% and operating costs are overstated by *y*% in 2001 then this is still the case in 2005/06. These percentages are determined by comparing cost output from the model for 2001 on an historic cost accounting (HCA) basis with MNOs accounts for the same period (given that the MNOs do not state cost information on an economic depreciation basis). However, Ofcom believes that economic depreciation is the most appropriate path of cost recovery for the purpose of setting regulated charges and has calculated the efficient charge level on this basis. In this context the correct split of capital and operating costs in determining the appropriate 2005/06 target average charge is the capital / operating cost proportions of the economic cost in 2005/06.

[48] The adopted approach (proposed in the December consultation) results in a very slightly higher capital cost adjustment.

C.54 As stated in paragraph F.80 of the December consultation, it was recognised in Annex E of the May consultation that varying the capital / operating cost proportions over time may well be appropriate. Indeed, there appears to be no disagreement that operating costs will grow in importance relative to capital costs under economic depreciation over the period in question. Given this acknowledgement, it is analytically more appropriate to recognise this trend in determining the proportion of economic cost in 2005/06 that is regarded as capital cost recovery rather than operating costs. The May consultation proposed to take a more conservative approach using the overall model forecast trend. However, given the reassessment of various detailed points following substantial responses to that consultation, and subsequent amendments of various aspects of the modelling in order to achieve more accurate results, it was consistent to also re-examine this issue in order to derive a commensurately accurate estimate.

C.55 With regards to O2's concern about using the LRIC model's trends rather than empirical evidence, the appropriate proportions of capital and operating costs in the 2005/06 target average charge are determined fundamentally by the specification of the path of cost recovery (as discussed below). In any case, it is unclear what evidence O2 intends given that 2005/06 lies in the future. Indeed, no MNO (including O2) has provided any further empirical evidence. It appears that T-Mobile believes that the approach taken in the December consultation followed the acquisition of MNO data in later years. This is not the case. Furthermore, as noted in paragraph F.94 of the December consultation, one of the reasons for choosing a date of comparison in 2001, rather than a later date, was the CC's desire to minimise the extent to which the information it obtained, such as GBV, was influenced by network costs relating to data services.

C.56 Contrary to Orange's opinion, Ofcom believes that it is appropriate to use the capital / operating cost trends in the model as this is entirely consistent with the underlying model trends which are used to determine the economic cost in 2005/06. Ofcom reiterates that the approach taken is to use the bottom-up LRIC model to provide an understanding of cost structures and relationships. As noted in paragraph F.115 of the December consultation, deriving cost trends from this bottom-up model and undertaking a single point comparison with top-down operator information constitutes a reasonable and conventional approach.

C.57 Ofcom acknowledges that the capital / operating cost proportions of the economic cost in 2005/06 do depend on the asset lifetimes assumed in the model and, as expected, shorter asset lifetimes result in a small increase in the proportion of economic cost in 2005/06 which can be attributed to capital cost recovery. However, Ofcom believes that the lifetimes used in the LRIC model produce a reasonable estimate for the cost of termination and for the reasons discussed in paragraphs C.23-C.30 above does not believe there is compelling evidence to adopt a different position when the results of the model in 2005/06 are not materially influenced by the adoption of shorter asset lifetimes.

C.58 With regards to T-Mobile's assertion that a more detailed approach is pursued regarding this issue but avoided elsewhere, T-Mobile appears to have failed to appreciate the difference in nature between this issue and the others with which it seeks a comparison. Whilst Ofcom has reservations about comparing *data* at a more detailed or 'granular' level, since this may result in less accurate results for the reasons set out in the December consultation (for example, paragraph F.87), the issue in this case concerns analytical consistency of model trends. As already noted, it is not disputed that operating costs increase as a proportion of total costs over time and therefore Ofcom believes that it is more accurate to recognise this trend in determining the efficient charge level.

C.59 The amendments to the LRIC model for cost of capital, pricing for 2G spectrum and treatment of equipment that declines in quantity (summarised in paragraph C.40 above) results in a small change to the capital / operating proportions from the LRIC model in 2005/06 in comparison to those stated in the December consultation (see paragraph F.81). The appropriate split becomes 28% and 72% for capital and operating costs respectively for a combined 900/1800MHz operator, and 30% and 70% for capital and operating costs respectively for an 1800MHz operator.

C.60 The overall impact on adjustments following comparison with the MNOs' data, implementing a capital cost adjustment of 38.7% and an operating cost adjustment of -8.5% (see paragraph C.22 above) together with the revised capital / operating cost proportions (but excluding any adjustment for the differential in costs between combined 900/1800MHz and 1800MHz operators), is an increase to the LRIC model output in 2005/06 of 0.19ppm for combined 900/1800MHz operators and 0.27ppm for 1800MHz operators. This compares with adjustments in the December consultation of 0.01ppm and 0.05ppm for the two operator types respectively.

Structural bias in the model and termination-specific adjustment

C.61 Vodafone (paragraphs B.1-B.3 of its response) still believes that calibration of the model at more than a single point in time is preferable and the argument that additional resources would be required to verify the data is insufficient. As in its previous submission, Vodafone goes on to state that it believes a termination-specific calibration should be undertaken with its FAC information as well as the information provided by its own version of the LRIC model.

C.62 In particular, Vodafone is concerned that there is a structural bias in the model so that different services display different degrees of discrepancy with the MNO data. Vodafone argues in paragraphs B.7-B.13 of its response that this necessitates a further termination-specific adjustment.

C.63 A response to Vodafone's arguments has already been set out in the December consultation. Specifically, as stated in paragraphs F.87 and F.115 of the December consultation, Ofcom believes that its approach to reconciliation is appropriate and fit for purpose. Vodafone appears incorrectly to believe that the main reason for not pursuing further calibration is that the activity would prove resource-intensive. Whilst it was noted that this approach would involve significant effort, as explained in paragraphs F.87 and F.113 of the December consultation, Vodafone's proposal has not been pursued primarily due to considerable doubt whether it would lead to more accurate results.

C.64 Ofcom has not received any compelling evidence from Vodafone to amend its position stated in the December consultation; however, its detailed points are addressed below.

C.65 Vodafone notes that the unamended results from the April 2002 LRIC model were described by Ofcom at that time as an adequate representation of an efficient operator, but amendments were subsequently conceded following the

CC inquiry. In the light of this and its FAC estimates, Vodafone does not believe there can be confidence that the "estimate of the cost of termination in 2005/06 is reasonable" (paragraph F.112 of the December consultation). The comment regarding the appropriateness of the LRIC model results prior to the CC inquiry needs to be taken in context. In paragraph A3.14 of the Review of the Charge Control on Calls to Mobiles, 26 September 2001, it was stated that:

Reconciliation with accounting-based figures has not, however, been possible, because the MNOs have supplied neither detailed accounting information nor top-down models. Furthermore, little evidence has been supplied by the MNOs to inform the data and assumptions for the bottom-up model. The robustness of the model's results would have been improved by the provision of such information. Nevertheless, the figures in the LRIC model represent the best estimates available for the cost of mobile termination and form a reasonable basis for setting charge caps.

C.66 Hence it was appropriate to update the estimates of the cost of termination in the light of the new evidence from MNOs supplied to the CC which had not been made available previously. In contrast, the further information provided by Vodafone regarding structural bias, already considered in the December consultation, is far from conclusive.

C.67 Vodafone emphasises that its FAC allocation algorithms were identical to those used in the LRIC model and thus its FAC results should be regarded as a floor to the average MNO FAC rather than dismissed as unusable. Vodafone's argument appears to be that if the basis of allocation used in the LRIC model and Vodafone's FAC construction are identical, then any discrepancies must be due to other factors than cost allocation, such as understated cost inputs, or structural bias in the LRIC model. These other factors are addressed through the high level reconciliation exercise and specific investigation of whether there really is structural bias in the LRIC model. This suggests that there is then little further value to be gained from undertaking a reconciliation with the FAC estimates for its own sake since the reasons for variation have been addressed by Ofcom in other ways.

C.68 For the reasons stated in paragraph F.87 of the December consultation, Ofcom believes that it is more appropriate to undertake a high level model reconciliation exercise (as adopted by the CC) rather than to conduct a more granular reconciliation exercise. Nevertheless, a short analysis of the available network depreciation information is described in paragraphs F.88-F.89 of the December consultation which suggests that Vodafone's data is unrepresentative of the four MNOs as a whole. Vodafone states that it is self-contradictory to analyse network depreciation data when this is the underlying information supporting the FAC analysis which Ofcom believes to be unreliable. Ofcom disagrees with Vodafone's conclusion. The difficulties associated with obtaining reliable FAC estimates is primarily due to the differences in cost allocation to services (specifically the termination service in this case), rather than a concern, necessarily, regarding the underlying cost data itself. Secondly, Vodafone provides two reasons why its network depreciation figures may differ significantly from the other MNOs. Ofcom does not contest that these may be plausible explanations; however, providing reasons for why Vodafone is unrepresentative of the average MNO simply provides support for Ofcom's argument that it is inappropriate to use Vodafone's specific figures given that the objective is to determine whether the model has a structural bias when compared to the *average* MNO. In any case, as set out in paragraph F.87 of the December consultation, Ofcom does not believe that Vodafone's proposed approach is appropriate. The use of network depreciation data is intended to highlight that, on the basis of the available information, a more granular analysis does not appear justified.

C.69 Vodafone also raises the point that substituting Vodafone's actually experienced MEA unit costs into the LRIC model results in a change in high level component cost categories indicating that the existing cost mix is inappropriate. This observation advocates a more detailed reconciliation exercise, however, for the reasons articulated in the paragraph above, this is not Ofcom's chosen approach and, for the reasons already described, it is unclear that adopting Vodafone's proposal would provide a representative result for the four MNOs taken as a whole.

C.70 If Ofcom was attempting to model each operator's specific network then Vodafone's version of the LRIC model would provide a very useful comparison. However, the chosen approach has been to model a generic average operator's network (taking account of differences in spectrum allocation) and to undertake a reconciliation with average information across all four MNOs. In this context Vodafone's version of the model is of more limited value and Vodafone's specific information and data is reflected through the aggregated comparison.

Combined 900/1800MHz and 1800MHz operator cost differential

1800MHz operator cost disadvantage underestimated

C.71 In its response to the May consultation, T-Mobile argues that the costs of an 1800MHz operator are higher than those of a combined 900/1800MHz operator for providing a similar level of quality and coverage. Orange supports this view by arguing that the conclusion reached by both Ofcom and the CC that the network costs of each network type are similar was erroneous since the comparison was undertaken at a point in time when T-Mobile had significantly lower coverage and call quality. Arguments and supporting evidence from the 1800MHz operators was considered in paragraphs F.92-F.98 of the December consultation, which ultimately concluded that there was no compelling reason to make further adjustments. In paragraphs II.58-II.66 of its response, T-Mobile sets out in detail why it still believes that there is a cost disadvantage suffered by 1800MHz operators which should be recognised.

C.72 T-Mobile claims in paragraph II.60(a) of its response that the core of its argument is not addressed in the December consultation. T-Mobile's key concern is that the conclusion that no cost difference existed between networks of different types arises *only* because of an invalid comparison in 2001 resulting in a downward bias of the average costs of a 1800MHz network. More specifically, T-Mobile raises a number of points relating to:

- definitions of coverage and quality: the definitions used in the December consultation fail to take account of a number of technical factors (paragraphs II.62 to II.65);

- increased coverage: T-Mobile states that its additional roll-out has been due not only to improvement in quality but also coverage (paragraph II.60 [b]);

- difference in quality: T-Mobile points out that Oftel's call success rate surveys clearly indicate a difference in quality between the operators at September 2001 (paragraph II.60 [c]);

- benefits to callers to mobile: T-Mobile argues that callers to mobile experience direct benefits of increased coverage and quality (paragraph II.61);

- site increase due to 3G: T-Mobile states that this concern lacks empirical evidence (paragraphs II.58-59).

C.73 In paragraphs II.63-II.65 of its response, T-Mobile comments on the definitions of network coverage, call quality and grade of service used in the December consultation stating that the reference to call quality being modelled in the LRIC model by means of a blocking probability percentage demonstrates confusion between *grade of service* and *call quality*. Specifically, T-Mobile disagrees with the definition of coverage presented in paragraph F.95 of the December consultation. Ofcom's view is that its definition of coverage is appropriate in the specific context of comparing the outputs of the LRIC model for different operator types. Ofcom acknowledges that its definition might not be appropriate for other uses, and agrees that the interaction of technical factors influencing coverage is a complex one. But this issue is not key in the context of comparing the economics of service provision using the two different network technologies.

C.74 T-Mobile disputes the suggestion in paragraph F.95 of the December consultation that the roll-out carried out by T-Mobile after the CC's comparison of data in 2001 was driven by the need to make improvements in quality rather than coverage. T-Mobile states that its investment was aimed at improving both these aspects of its network. Ofcom has considered the evidence presented by T-Mobile in support of this point, noting T-Mobile's submission that its cell count and land area coverage have both increased. In practice there are substantial difficulties inherent in attempting to quantify the extent to which the network roll-out undertaken by T-Mobile since the date of comparison has been driven by each of: (1) improving coverage to bring T-Mobile's network reach in line with the other MNOs; (2) improving quality; and (3) meeting increasing capacity requirements. This is especially so given the specific definition of coverage appropriate to this reconciliation exercise. As outlined in paragraph C.75 below, at the date of comparison, the average combined 900/1800MHz operator had broadly the same quality of service as the average 1800MHz operator. This means that only additional roll-out falling into the first of the above categories would be relevant in comparing the relative costs of generic combined 900/1800MHz and 1800MHz operators. Ofcom notes that T-Mobile has not provided a quantification of roll-out arising specifically from the category above. Ofcom has formed its view on the extent to which the costs of combined 900/1800MHz and 1800MHz operators differ based on a high level consideration of a number of measures. It has considered the extent to which the conclusions it has drawn from an analysis of these measures would be altered by modifying the data submitted by T-Mobile to reflect increased geographic coverage. Ofcom's view, in the light of the practical difficulties referred to above, is that it does not have compelling evidence to change its view that neither operator type had a significant cost advantage over the other (on an accounting basis) at the date of comparison.

C.75 With regards to differences in quality, T-Mobile supports its view by referring to Oftel's call success rate surveys which clearly indicate a difference in quality between the operators at September 2001, with T-Mobile's percentage of calls connected and successfully completed below that of both O2 and Vodafone. Ofcom agrees that ensuring comparability of data at the given point in time is a key issue in the context of its reconciliation exercise and hence a valid comparison of MNO data requires a comparable level of, amongst other things, network quality. Contrary to T-Mobile's suggestion, it is not clear to Ofcom that the average 1800MHz operator's service quality differed materially from that of the average combined 900/1800MHz operator at the date of comparison. As highlighted by T-Mobile, the Oftel call success rate survey indicates that T-Mobile had a lower service quality than the other three MNOs. However, the relevant comparison is the *average* network quality of the combined 900/1800MHz operators (Vodafone and O2) compared with that of the 1800MHz operators (Orange and T-Mobile). Since Orange's network quality had, historically, been the highest of the MNOs, the network quality for the average 1800MHz operator was very similar to that of the average combined 900/1800MHz operator in 2001.

C.76 T-Mobile states that if MNO network equipment information had been considered for a *given level of quality of service*, not only would it demonstrate the need for a greater number of cell sites required by 1800MHz operators than combined 900/1800MHz operators, but also that the number of cell sites for the average 1800MHz operator was substantially above that calculated by the LRIC model. The operating and capital cost adjustments made to the outputs of the LRIC model ensure that its cost estimates are in line with the average of the four MNOs. T-Mobile's arguments, however, relate to the relativities of the averages of the two combined 900/1800Mhz operators and the two 1800MHz operators. The networks of the MNOs have each evolved at different rates, based on the evolving capacity requirements and roll-out strategies of each MNO. Therefore, using high level information such as total network GBV, total network operating cost, and total number of sites is an imperfect means by which to establish whether or not the economics of a generic combined 900/1800MHz operator are more than, less than, or approximately as favourable as those of a generic 1800MHz operator. Ofcom has analysed data submitted to the CC by the MNOs regarding their number of cell sites, capacity in sectors, number of TRXs, total network GBV and depreciation, and total network operating costs. Each of these indicators has various merits and flaws when used to indicate which of the two mobile technologies is more costly to deploy. Ofcom has taken account of all of these measures. Based on its analysis, Ofcom's view is that the CC's conclusion, that neither the combined 900/1800MHz operators nor the 1800MHz operators had a significant cost advantage over the other at the date of comparison, is reasonable. Ofcom has also considered technical arguments made by both T-Mobile and Vodafone, each of which argues that their own network type is the more costly to deploy. Ofcom's view is that both submissions have a degree of merit, and the analysis of the MNO data is likely to represent the best way of determining the relative costs of each operator type.

C.77 T-Mobile argues that callers to mobiles experience direct benefits of increased coverage and quality and the proposals are discriminatory as they only allow the 1800MHz operators to recover a contribution based on a lower level of quality than that for combined 900/1800MHz operators. As stated in paragraph F.95 and expanded upon in paragraphs F.163-F.165 of the December consultation, it is unclear to Ofcom that callers to mobiles should be obliged to pay more for a higher quality of service chosen by call recipients. Ofcom does not believe that this position is discriminatory. As stated above, the *average* quality of the combined 900/1800MHz operators and *average* quality of the 1800MHz operators at the point of comparison appears to be similar, on the basis of the available information.

C.78 T-Mobile comments further in paragraph II.62 of its response why it believes that the calculation described in paragraph F.96 of the December consultation demonstrating the minimal impact on the LRIC model outputs to an increase in quality is flawed. It appears that T-Mobile may have misunderstood the intention of the analysis. The sensitivity was not designed to test T-Mobile's core concern relating to the average service quality and costs associated with each operator type but rather to test the impact of increasing overall modelled quality in the model *after* 2001. This sensitivity was aimed only at introducing a trend in blocking probability over time, i.e. departing from the assumption that it was constant in all periods.

C.79 Ofcom notes T-Mobile's clarification in paragraphs II.58-II.59 of its response regarding 3G cell site deployment. Paragraph F.94 of the December consultation sought to reiterate one of the advantages of relying on the CC's 2001 calibration point, rather than collecting new data, due to the need to focus on costs associated with 2G voice services. This text was not intended to assert that all of an operator's additional expenditure after 2001 would be driven by 3G costs. Information subsequently provided by T-Mobile does not change Ofcom's view of the relative costliness of running combined 900/1800MHz and 1800MHz networks. The operational and financial data provided to Ofcom by all the four MNOs is the key evidence that has led to this view.

C.80 In section 3.3.2.F of its response, Orange states that the adjustment to cancel out the operator-type cost differential ignores the significant higher costs of 1800MHz operators in providing rural and in-building coverage. Ofcom emphasises that it has not ignored factors arising from the difference in the nature of the 900MHz and 1800MHz spectrum in its consideration of this issue, as evidenced, for example, by the discussion in paragraph F.101 of the December consultation.

C.81 In conclusion, on the basis of the information available to Ofcom and the reasoning set out in paragraph F.98 of the December consultation, Ofcom believes that the view that neither operator type had a significant cost advantage over the other (on an accounting basis) is reasonable. Having given careful consideration to the potential differences in costs between the two types of networks, Ofcom considers that its treatment meets the tests in section 47(2)(b) of the Act.

1800MHz operator cost disadvantage overestimated

C.82 In paragraphs B.34-B.39 of its response, Vodafone continues to question the adequacy of the proposed adjustment of 0.2ppm to satisfactorily resolve the inter-operator network size differential. Vodafone states that this value only attempts to adjust for the perceived equality in network size looking forwards from the date of comparison and hence implies that the relative size of the differential generated by the model in prior years is regarded as reasonable. Vodafone states its continued belief that the network size differential in the model is exaggerated with the consequence that the economic depreciation differential is also exaggerated in years after 2001/02.

C.83 Regarding the detailed calculation of the adjustment, Vodafone states that its examination of the LRIC model indicates that the difference in HCA output in 2005/06 is 0.18ppm. However, Vodafone argues that this differential needs to be uplifted by the capital adjustment factor to reflect the fact that the figure has been generated by a model which underestimates the underlying network size. In section 3.3.2.F of its response, Orange notes that the CC derived a differential in the range of 0.13ppm to 0.2ppm and hence believes that the proposals are unfairly biased against 1800MHz operators by using the maximum within this range.

C.84 The path of cost recovery chosen for determining the efficient charge in 2005/06 is economic depreciation. Whilst Ofcom recognises that the use of economic depreciation means that the inter-operator differential in 2005/06 is partially determined by the extent of cost recovery achieved in earlier years, Ofcom does not believe there is compelling evidence to support Vodafone's belief that the differential has been overstated by the model in the period prior to 2001. A response to Vodafone's arguments regarding this issue is set out in paragraphs F.99-F.106 of the December consultation. Vodafone has not provided any further underlying reasoning for why the algorithms in the LRIC model should result in an overstatement of this differential.

C.85 However, Vodafone supplements its previous response by presenting a table showing that the GBV differential for the two types of operators predicted by the model is significant in earlier years. Ofcom regards this comparison as irrelevant. The objective is to determine the inter-operator differential, in terms of economic cost, in 2005/06. The underlying approach taken to estimating this differential compares the model with 2001 accounting data and then allows the model output to reflect any changes that may be appropriate in this differential between 2001 and 2005/06 on an economic cost basis. Since the basis for cost recovery used to determine the efficient charge level in 2005/06 is economic depreciation, the cost differential in historic years in accounting terms is not relevant.

C.86 Furthermore, Vodafone makes a number of observations which it claims indicate that the historic inter-operator differential is overstated. Specifically, Vodafone disagrees with Ofcom's position since: it is based on comparison of quantities rather than taking account of the cost of network units; the only differences between the two operator types exist at the radio layer; and Vodafone believes that structural bias in the model means that costs in the radio layer are overemphasised. In response, Ofcom does not believe that its position regarding the inter-operator differential only considers differences in quantities rather than costs. The position that, at current traffic levels of the MNOs, both operator types have a similar amount of network equipment and hence similar costs (see paragraph F.90 of the December consultation) is based on a comparison not only of inter-operator equipment levels but also inter-operator GBV. The unit costs used in model are identical for both types of operators, consistent with the view that prices for equipment are now very similar (see paragraph 2.303 of the CC report). Secondly, Ofcom agrees that the only difference between the two operator types exists at the radio layer (which is reflected in the LRIC model), however, Ofcom does not accept Vodafone's point regarding structural bias (as discussed in paragraphs C.61-C.70 above).

C.87 Regarding Vodafone's final point, following the amendments described in paragraphs C.13-C.15 and C.19-C.21 above relating to the revision of 2G spectrum pricing and treatment of assets which decline in quantity, the difference in HCA outputs in 2005/06 increases from 0.18ppm to 0.25ppm. Ofcom agrees that it would be more accurate to reflect the adjustments resulting from comparison with operator data in determining the size of the inter-operator differential since this adjustment is aimed at reflecting parity in the size of the operators' networks. However, Ofcom disagrees that it is appropriate to simply uplift the 0.25ppm figure by the capital cost adjustment. Rather, it is more appropriate to apply an adjustment which reflects the capital cost adjustment (38.7%) and operating cost adjustment (-8.5%). Since the objective is to determine the differential, in HCA terms, for 2005/06 it seems most appropriate to apply the capital and operating cost adjustments to the HCA mix of capital and operating costs in 2005/06 (33% in capital costs and 67% in operating costs according to the model output). The net impact is a 7% uplift to the 0.25ppm difference in HCA outputs in 2005/06 which results in a difference of 0.27ppm. Given that the LRIC model outputs have already been adjusted to reflect the average MNO across both operator types, this figure translates into an upward adjustment of 0.135ppm for combined 900/1800MHz operators and a downward adjustment of 0.135ppm for 1800MHz operators in 2005/06.

Appropriate basis for cost recovery

C.88 O2 (pages 2-3 of its response) notes that whilst the December consultation states the continued belief that combined 900/1800MHz operators and 1800MHz operators have similar costs on an HCA basis, it maintains the use of economic depreciation which has the effect of increasing the future termination revenues that the 1800MHz operators would enjoy, resulting in distortion of competition in the outgoing market.

C.89 In response to paragraph F.109 of the December consultation, which states that it is for the MNOs and their investors to decide upon the most appropriate basis for accounting and performance measurement, O2 believes that it is not practicable to amend its accounting methodology and hence the use of economic depreciation is discriminatory and Ofcom should use accounting depreciation instead.

C.90 Furthermore, O2 states that economic depreciation means that the costs for 1800MHz operators should have been lower than the costs for combined 900/1800MHz operators in the past. However, the proposals do not take into account the fact that 1800MHz operators have applied higher charges in the past.

C.91 In response to O2's first point, as set out in paragraphs F.108-F.110 of the December consultation, economic depreciation does give rise to a differential in the efficient charge level for the two types of operators. This differential reflects the difference in economic costs which are higher for 1800MHz operators. Ofcom maintains the opinion that economic depreciation provides the best view of the appropriate path of cost recovery over time for the purpose of setting regulated charges, being the path of costs that would prevail in a competitive market.

C.92 Regarding the appropriate basis for accounting and performance measurement, contrary to O2's belief, the December consultation (paragraph

F.109) did not suggest that MNOs should amend their accounting methodology but merely sought to note that accounting methodology for statutory or commercial purposes is a separate matter which, in this context, is of less relevance than the appropriate basis of cost recovery for regulatory purposes. Ofcom notes that if a current cost accounting approach was taken to setting regulated charges, rather than economic depreciation, the efficient charge level in 2005/06 would be lower by almost 1ppm for combined 900/180MHz operators and about 1.5ppm for 1800MHz operators.

C.93 O2 is incorrect to suggest that economic depreciation ought to have resulted in the cost of termination for 1800MHz operators in the past being lower than for combined 900/1800MHz operators. Indeed, examination of the output of the LRIC model shows that the economic unit cost for 1800MHz operators is higher than for 900/1800MHz operators at all points in time (reflecting lower average utilisation).

Summary of net adjustments following comparison with MNO data

C.94 The derivation of the net adjustments to be made for the combined 900/1800MHz operators and 1800MHz operators in the years up to 2005/06 is shown in the table below.

Table 7: Net adjustments following comparison with MNO data

Pence per minute (real 2000/01)	***2001/02***	***2002/03***	***2003/04***	***2004/05***	***2005/06***
900/1800MHz operators					
LRIC+ (revised)	4.73	4.41	3.79	3.58	3.76
Capital cost adjustment	0.95	0.82	0.58	0.50	0.42
Operating cost adjustment	-0.19	-0.19	-0.19	-0.19	-0.23
900MHz / 1800MHz adjustment	0.14	0.14	0.14	0.14	0.14
Net adjustment	0.89	0.76	0.52	0.44	0.33
Resulting LRIC+	5.62	5.17	4.31	4.02	4.09
1800MHz operators					
LRIC+ (revised)	5.87	5.43	4.59	4.31	4.55
Capital cost adjustment	1.26	1.09	0.76	0.65	0.54
Operating cost adjustment	-0.22	-0.22	-0.22	-0.22	-0.27
900MHz / 1800MHz adjustment	-0.14	-0.14	-0.14	-0.14	-0.14
Net adjustment	0.91	0.74	0.40	0.29	0.14
Resulting LRIC+	6.78	6.17	4.99	4.60	4.69

C.95 The net adjustments of +0.33ppm and +0.14ppm (in real 2000/01 terms) for combined 900/1800MHz operators and 1800MHz operators respectively are approximately 0.2ppm higher than those proposed in the December consultation (net adjustments of +0.11ppm and -0.05ppm for combined 900/1800MHz operators and 1800MHz operators respectively). These increases reflect the amendments set out above: revisions to the cost of capital; 2G spectrum pricing; the treatment of equipment that declines in quantity; and the size of the inter-operator differential.

Network common costs

Magnitude of network common costs

C.96 Vodafone raises the issue of the appropriate definition of fixed and common costs in paragraphs 1.48-1.52 of its response. Whilst Vodafone states that it will not repeat its previous arguments on this matter, it notes that the consultancy Analysys has taken a different view in its work for the Swedish national regulatory authority.

C.97 Ofcom's position regarding minimum coverage network common costs has been clearly set out in a number of documents, most recently in paragraphs F.128-F.142 of the December consultation and the references therein. For that reason, Ofcom's reasoning is not repeated here.

C.98 With regards to Vodafone's further observation, whilst Ofcom employed the consultants Analysys as its advisors on LRIC modelling and therefore gave consideration to Analysys' views, Ofcom itself was responsible for leading this process and developing this work. In this context, Ofcom does not consider the approach taken by Analysys in its work elsewhere to be relevant in itself, in the absence of new substantive arguments.

Allocation of network common costs to handsets

C.99 Vodafone submits that the presence of a handset cost in the LRIC model has no function other than for constructing an annual total which absorbs a portion of network common costs (paragraph B.23 of its response). It is unclear to Vodafone that this approach is appropriate given that network common costs are related to traffic not handsets.

C.100 As recognised in paragraph 7.18-7.19 of the Review of the Charge Control on Calls to Mobiles, published on 26 September 2001, some network costs depend on the number of customers that a network has rather than the volume of traffic. For example, the cost of handsets is clearly driven by the number of customers rather than the volume of traffic. Such costs are an integral aspect of the supply of mobile services. This is reflected in the LRIC model which considers two increments: subscribers and traffic[49]. As explained in paragraph F.153 of the December consultation, Ofcom considers subscription to be a service in its own right with a demand, a cost (driven by number of customers) and a price. Giving due consideration to economically efficient prices, it is reasonable that the recovery of common costs should reflect that the cost of

[49] For further details see *Network Common Costs*, Oftel, 19 February 2002, http://www.ofcom.org.uk/static/archive/oftel/publications/mobile/ctm_2002/network_costs.pdf

supplying mobile services is driven by both traffic volumes and subscriber numbers.

Non-network common costs

Treatment of customer acquisition, retention and service (CARS) costs

C.101 In paragraphs I.16-I.19 and II.41-45 of its response, T-Mobile reiterates its argument that the majority of CARS costs concern the acquisition and retention of customers and since the purpose of this expenditure is to earn revenue, including termination revenue, these costs represent a common cost. T-Mobile argues that common costs should be recovered in a way which maximises overall consumer welfare but the failure to recognise CARS costs as common costs results in retail prices which are substantially higher than is optimal. Since customers are sensitive to up-front charges, these costs will need to be recovered from outgoing calls resulting in an inefficient, unbalanced pricing structure.

C.102 T-Mobile also argues that the higher termination charges are above incremental cost, the greater the incentive to MNOs of attracting and retaining customers hence the greater the investment in CARS. Given that the proposed level of the charge for termination is above LRIC, T-Mobile claims that an element of CARS is incremental to termination.

C.103 T-Mobile has not raised any new substantive arguments to support its belief that CARS costs represent a common cost across all services. Ofcom remains of the view (shared by the CC[50]) that CARS costs are not causally related to termination since they do not vary with incoming traffic and therefore should not be included in either the LRIC, or the mark-up for common costs. Ofcom's reasoning is set out in detail in paragraphs F.147-F.157 of the December consultation. As stated in paragraph F.154 of the December consultation, Ofcom believes that a contribution to the recovery of CARS is relevant to the termination charge only through the network externality surcharge.

C.104 Ofcom considers CARS costs to be incremental to the provision of retail services, specifically subscription and mobile-originated calls, hence these costs should be recovered from the (unregulated) price of retail mobile services which MNOs are free to structure as they wish (see paragraphs F.149 and F.153 of the December consultation). Since Ofcom does not agree that CARS costs are common, it does not accept T-Mobile's view that Ofcom's efficient charge level for termination will lead to retail prices which are higher than is optimal or that the resulting pricing structure would be inefficient (since it is inappropriate to recover the vast majority of these costs from termination services).

C.105 Ofcom agrees with T-Mobile that the higher termination charges are raised above incremental cost, the greater the value of attracting / retaining subscribers and the greater the willingness to invest in CARS. However, this does not mean that there is an element of these costs which are incremental to termination. T-Mobile's view would appear to be based on a possible misunderstanding of what is meant by *incremental* in the context of the

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[50] See the CC report paragraphs 2.320-2.333

principle of LRIC. A cost should not be included in the LRIC of a service if it is not *incurred* or *caused* in the long run by that service[51]. T-Mobile's argument appears to be based on a demand-driven view rather than a regard for the cost of supplying a service. T-Mobile's apparent confusion is further evidenced by its claim (footnote 57 of its response) that "the CC accepted that an element of acquisition and retention costs was incremental to termination" in paragraph 2.327 of the CC report. This is not the case. The CC accepted that "there is probably some correlation between the intensity of call making and that of call receiving" and hence a *correlation* between investment in CARS and the volume of incoming calls. However, this observation does not lead to the conclusion that part of CARS costs is incremental to termination. As stated in paragraph F.149 of the December consultation, CARS costs are not incurred by the supply of termination services but are caused by the desire to acquire and retain retail customers and so are incremental to retail activities.

Inclusion of all MNO cost accounting data

C.106 Vodafone (paragraphs B.42-B.44 of its response) seeks confirmation that Orange's 'further network overhead costs' discussed in paragraph F.173 of the December consultation have been included in the calculation of the average MNO network operating cost figure of £338m and that Vodafone's network operating cost total, as reported to the CC, is also appropriately included in this calculation.

C.107 As indicated in paragraph F.173 of the December consultation[52], whilst the CC removed Orange's 'further network overhead costs' to derive a non-network administration cost figure, these 'further network overhead costs' have been reallocated to Orange's network operating cost figure, which is then used in the calculation of the average of £338m, rather than failing to be recovered. Furthermore, Ofcom confirms that Vodafone's network operating cost figure, as reported to the CC, is indeed included in the derivation of the average of £338m.

Allocation of non-network administration costs

C.108 As stated in paragraph B.53 of its response, Vodafone continues to believe that the appropriate cost-causation approach to allocation of non-network administration costs should consider retail costs composed of sales and marketing and customer care costs but excluding the costs associated with handsets, discounts and incentives.

C.109 However, following the methodology to allocate administration costs between network and retail costs set out in the December consultation (paragraph F.181), Vodafone (paragraphs B.45-B.52 of its response) believes that all cost elements included in the retail activities category have been taken account of, but the costs included in the network category are not similarly complete. Orange makes a similar point in Section 3.3.2.E of its response. On this basis, Vodafone and Orange believe that there are two network costs missing:

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[51] The CC shares this view – see paragraph 2.248(b) of the CC report

[52] Paragraph F.173 of the December consultation contains a misprint – the reference should have been to Table 3 of Appendix 7.4 of the CC report (rather than Table 7).

- cost of capital tied up in the capital base (depreciation alone is an inadequate measure of the cost of acquiring the network);

- interconnect costs.

C.110 Orange makes the further point that there is a trend for retailers to source handsets directly and so it is unclear that operators will continue to provide handsets in the future. Orange also states that if Ofcom shares the CC's objective that the frequency of handset replacement is reduced then it is only consistent for the purpose of cost modelling to assume that lower levels of handset subsidy prevail in 2005/06.

C.111 T-Mobile argues in paragraph II.46 of its response that these non-network common costs should be recovered so as to maximise efficiency and overall consumer benefits. Instead, T-Mobile states that the proposed approach in the December consultation is arbitrary and not even based on EPMU which would result in percentage mark-ups on costs which are the same rather than mark-ups on different voice minutes which are equal.

C.112 In response to Vodafone's previous point regarding the correct treatment of administrative costs from a cost-causation principle, Ofcom's view is that common costs should be recovered from all the activities that these costs help to support. This position is stated more fully in paragraph F.186 of the December consultation.

C.113 Regarding Vodafone and Orange's concern that network costs have been understated because depreciation alone fails to capture the full cost of acquiring the network, Ofcom agrees that a better measure of this cost is the sum of network depreciation and the cost of capital associated with the network assets. Ofcom has therefore amended its assessment of the relevant average MNO network costs in 2001 for the purpose of allocating non-network administration costs. As before, Ofcom has taken the average network cost (excluding cost of capital) of £607m[53] but added a further £248m to allow for cost of capital, derived from the average MNO network net book value of £1,639m[54] and a nominal cost of capital of 15.14%[55] which corresponds to the real rate of 12%. This gives rise to a total average MNO network cost of £855m. Comparing this network cost to the total average retail (CARS) costs in 2001 of £1,276m[56] results in 40% (£855m / (£855m + £1,276m)) of the £159m[57] administrative overheads being allocated to network activities using an equal proportionate mark-up (EPMU). Dividing the resulting administrative

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[53] See Table 7.2 of the CC report.

[54] See Table 7.3 of the CC report.

[55] A nominal cost of capital is appropriate to compensate investors for inflation in the absence of updating the capital asset base (for 2001) which is expressed in nominal values. The cost of capital of 12% (rather than the cost of capital in 2001) is more appropriate since the objective is to derive the mark-up in 2005/06. This is consistent with the approach taken by the CC in paragraph 7.98 of the CC report.

[56] See Table 7.9 of the CC report.

[57] See paragraph F.175 of the December consultation and Table 7.9 of the CC report.

cost attributable to network by the average total minutes for the year (comprising incoming, outgoing and on-net voice minutes) of 15.5 billion[58] results in a non-network common cost mark-up to the LRIC of voice call termination of 0.41ppm (in real 2000/01 terms). This compares with a non-network common cost mark-up of 0.33ppm proposed in the December consultation.

C.114 In contrast, Ofcom disagrees with Vodafone and Orange that a further amendment should be made for interconnect costs. The £410m referred to by Vodafone, and presented by in Table 7.2 of the CC report, refers to interconnect payments associated with outgoing calls. As noted in Table 7.2 of the CC report, these costs are not relevant to incoming calls and therefore not relevant to the mark-up on termination. These costs are not incurred in relation to a MNO's own network but are costs incurred in the provision of retail (outgoing) calls. Hence there is an argument for including these interconnect costs in the retail (non-network) cost category but not in the network cost category. In the interests of ensuring that the non-network common cost mark-up is not understated, Ofcom has chosen not to add interconnect costs to the retail cost category but to maintain its existing approach.

C.115 In response to Orange's further points, Ofcom notes Orange's view that MNOs' provision of handsets may reduce in the longer term if retailers increasingly source handsets directly from suppliers, however, Ofcom believes that the impact of this is likely to be minimal during the period of the charge control which ends in March 2006. With regards to reflecting lower handset subsidies in 2005/06, the level of handset subsidies is irrelevant to the calculation of the non-network common cost mark-up which refers to gross handset costs.

C.116 T-Mobile's belief that these common costs should be recovered so as to maximise efficiency and overall consumer benefit appears to imply the use of Ramsey mark-ups. As stated in paragraph 6.8 of Chapter 6 and Annex K of the December consultation, Ofcom believes that it is more appropriate to recover these costs on the basis of the relative proportions of network costs to the total of network and retail costs. This results in equal proportionate mark-ups on network services and retail services. However, T-Mobile is correct in observing that the mark-up approach used is a variant of an EPMU approach. There is a two-stage approach. First, a part of the non-network common cost is allocated to network traffic services using an EPMU on retail and network traffic costs. Then, the allocation of non-network common costs to network services (£64m) is recovered through a fixed mark-up per minute which is the same for all traffic services (outgoing, incoming and on-net voice minutes), rather than through a mark-up on the cost of each of these traffic services. Ofcom has calculated the non-network common cost mark-up on termination resulting from a mark-up on the cost of each service rather than a fixed mark-up per minute, using the economic cost recovered for the three traffic services in 2005/06. Whilst T-Mobile is correct in its belief that this leads to a higher per minute mark-up on termination than on outgoing calls, on-net call minutes have a significantly higher cost than termination (because they include both ends of the call) and therefore attract an even higher per minute mark-up under this approach. The net effect would be a non-network common cost mark-up on termination of

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[58] Based on information provided to the CC by the MNOs – see Table 7.14 of the CC report.

0.31ppm which is lower than the 0.41ppm using the existing approach, after correction for the network cost of capital. Whilst both methods are a reasonable approach to the recovery of non-network administrative overheads, Ofcom sees insufficient reason to merit changing its approach and believes the existing method has the additional benefit of ensuring that the non-network common cost mark-up is not understated.

Conclusion

C.117 In conclusion, the table below sets out the amended LRIC+ figures (at 12.25% cost of capital) from the December consultation and the further adjustments discussed in this annex to derive the LRIC+ figures that include the EPMU for network and non-network common costs. The efficient charge level is then determined by the sum of the adjusted LRIC+ figures below and the surcharge for the network externality (discussed in Annex D).

C.118 The resulting LRIC+ figures (excluding the network externality surcharge) in 2005/06 of 4.50ppm and 5.10ppm (in real 2000/01 terms) for combined 900/1800MHz and 1800MHz operators respectively, are approximately 0.30ppm higher than those proposed in the December consultation.

Table 8: Revised LRIC+ (excluding network externality) figures

Pence per minute (real 2000/01)	*2001/02*	*2002/03*	*2003/04*	*2004/05*	*2005/06*
900/1800MHz operators					
Model LRIC+ (December consultation)	5.07	4.76	4.15	3.95	3.76
Cost of capital adjustment – 12%	0.02	0.02	-0.04	-0.03	-0.03
Revision for 2G spectrum pricing	-0.23	-0.25	-0.22	-0.22	0.13
Revision for declining equipment quantities	-0.13	-0.12	-0.11	-0.11	-0.11
Revised Model LRIC+	4.73	4.41	3.79	3.58	3.76
Capital / operating cost adjustment	0.89	0.76	0.52	0.44	0.33
Non-network common cost mark-up	0.41	0.41	0.41	0.41	0.41
Resulting LRIC+ (exc network externality)	6.03	5.58	4.72	4.43	4.50
1800MHz operators					
Model LRIC+ (December consultation)	6.26	5.85	5.03	4.75	4.50
Cost of capital adjustment – 12%	0.03	0.03	-0.05	-0.05	-0.04
Revision for 2G spectrum pricing	-0.35	-0.38	-0.32	-0.33	0.15
Revision for declining equipment quantities	-0.07	-0.06	-0.06	-0.06	-0.06
Revised Model LRIC+	5.87	5.43	4.59	4.31	4.55
Capital / operating cost adjustment	0.91	0.74	0.40	0.29	0.14
Non-network common cost mark-up	0.41	0.41	0.41	0.41	0.41
Resulting LRIC+ (exc network externality)	7.19	6.58	5.40	5.01	5.10

Annex D

The network externality surcharge

Introduction

D.1 In the May and December consultations, Ofcom proposed that it would be appropriate to allow MNOs to add an additional mark-up on cost when setting charges for mobile termination services. This mark-up (or surcharge) was designed to ensure MNOs account for the external benefits that callers to and from mobile telephones receive from the addition of new subscribers to the network, and the maintenance of existing subscribers on the network.

D.2 In both of these consultations, caution was expressed regarding the estimation of a surcharge, noting that the conceptual and practical estimation obstacles were formidable. A judgement was made on the basis of a range of estimates produced by different models of behaviour in wholesale and retail mobile markets. Each of these estimates provided a relevant, although incomplete, perspective on the efficient surcharge.

D.3 Ofcom maintains a similar approach to the calculation of the appropriate surcharge in this Statement. The following sections contain a brief outline of the approach in the December consultation, responses to the December consultation and Ofcom's comments on these, and conclusions.

Summary of previous approach

D.4 As noted in paragraph D.1, the purpose of the network externality surcharge is to correct for potential economic inefficiencies that may be created if the subscription charge levied by MNOs only reflected the costs of supply. Consumer welfare could be potentially improved if some consumers who would not otherwise join a mobile network had their subscription subsidised, because these consumers' joining decisions increase the welfare of existing subscribers. To the extent that any such subsidies need to be funded by MNOs, Ofcom believes it would be appropriate for wholesale mobile termination charges to include a contribution towards the recovery of these subsidies.

D.5 Paragraphs G.4 to G.9 of the December consultation provide further justification for a network externality surcharge.

D.6 As explained in paragraph D.2, estimation of an appropriate surcharge is very complex. Six estimates were provided in the December consultation, each reflecting different but individually relevant considerations. These estimates, and the relevant considerations, are presented below for reference.

Table 1: Summary of estimates used in the December consultation

Source	*Description*	*Optimal surcharge*
Rohlfs targeting model*	• Incorporates ability of MNOs to distinguish marginal and infra-marginal subscribers through price discrimination	0.07ppm
Rohlfs principal-agent model*	• Incorporates MNOs sub-optimal use of higher mark-ups on termination	0.07ppm
Previous surcharge (MMC)	• See MMC report, appendix 5.2 for further details.	0.50ppm
CC report	• See CC report, appendix 8.1 for further details.	0.45ppm
Rohlfs no targeting model*	• A linear pricing model (no price discrimination) with some internalisation of externalities by MNOs assumed.	0.49ppm
Rohlfs model – reduced internalisation*	• Reduces assumptions about amount of externality internalised by MNOs (increasing the usage cross-elasticities, j2 = 0.5, j4 = 0.5, n = 0.25).	0.67ppm

* The Rohlfs models were updated to take account of revised LRIC inputs.

D.7 The Rohlfs models referred to in the table are described in more detail in Dr Rohlfs' paper *A Model of Prices and Costs of Mobile Network Operators* (May 22, 2002). The Rohlfs models provide an estimate of the optimal mark-up to recover common costs as well as an adjustment for externalities. Given that Oftel preferred to use the EPMU approach for the recovery of common costs, adjustments to the estimates to isolate the effect of externalities on the optimal set of prices were required. The method by which this done is discussed further at paragraph D.36.

D.8 On the basis of the available evidence, 0.4ppm was considered to be a reasonable externality surcharge.

Responses to the December consultation

BT / UKCTA

D.9 BT did not believe an externality surcharge was justified. BT suggested that an untargeted scheme, which provides for a subsidy to both infra and inter-marginal consumers, is unlikely to deliver efficiency benefits. Fixed line users will subsidise all mobile users, most of whom would have a handset even without a subsidy. Further:

- there is a surcharge on fixed users to subsidise mobile users, but no equivalent surcharge to fund fixed users; and
- there is no scheme to attract marginal mobile users in place.

D.10 Hence, the effect is that the subsidy effectively promotes mobile services over fixed services. The UK Competitive Telecommunications Association (UKCTA) provided similar comments.

D.11 Ofcom recognises that targeting of marginal consumers is an important issue with respect to the calculation of the appropriate externality surcharge. It is indeed the case that where there is no specific scheme in place to subsidise marginal consumers, subsidies could well be offered to both infra-marginal and marginal subscribers. It is also true that if substantial targeting of subsidies to marginal consumers occurs, the appropriate subsidy is likely to be significantly lower. However, the lack of ability to target does not imply that no subsidy is appropriate – the welfare costs of raising the surcharge must be balanced against the potential benefits that a surcharge will deliver. This is illustrated in the Rohlfs "no targeting" model, in which it is assumed all subscribers are offered the same (subsidised) subscription price.

D.12 On the issue of consistency of treatment between the fixed and mobile sectors, Ofcom believes that Ofcom's comments in the December consultation address this point (see Annex G.18). Similar objectives exist with respect to marginal subscribers on both types of networks. However, for a combination of historical and efficiency reasons (closely related to its USO obligations), BT has financed schemes aimed at marginal subscribers to fixed networks out of profits from supplying call services. Ofcom's forthcoming review of the Universal Service Obligation (scheduled for summer 2004) will likely examine this issue further.

D.13 The UKCTA suggested that the practical evidence cast doubt on the need for a mark-up to cover network externalities. In particular, it referred to Professor Martin Cave's statement that up until 2000-01 the MNOs aimed to maximise subscriber numbers, but after this:

"… they re-focused their growth policy, reduced subsidies and some of them saw the number of subscribers fall. They changed their growth policy from maximisation of subscriber growth to optimisation and maximisation of profits. This suggests that we might have had a higher than optimal level of mobile penetration at that time." (UKCTA, page 5)

Ofcom's response

D.14 Ofcom does not consider this point undermines the rationale for a network externality surcharge. The surcharge effectively promotes behaviour (subsidisation of marginal subscribers) intended to promote overall consumer welfare. This may involve providing subsidies to consumers to either join a network, or to maintain their network subscription. Consequently, even if it could be shown that at a point in time penetration was already at or above the efficient level, it would not follow that for future periods no subsidy was justified. It may well be efficient for subsidies to be provided to maintain existing subscribers on the network.

D.15 UKCTA also cites from the Cave report to question an adjustment for the network externality, but not for the "call externality". The call externality relates to the originating party, who pays for the call, failing to take into account the benefits of the call to the receiving party (who may value the call, but pays nothing). Hence, internalising the call externality might result in optimal call termination charges being below cost.

"Mobile networks, as well as other telecoms networks, are characterised by network and call externalities. If network externalities prevail, access to the network should be subsidised in an efficient manner to internalise those effects. Handset subsidies in mobile networks partially fulfil this function. Fixed network users may contribute to that subsidy by paying termination charges above costs. On the other hand, termination charges below cost help to internalise call externalities." (UKCTA, page 6)

Ofcom's response

D.16 Call externalities – while they almost certainly do exist – probably do not justify any adjustment to call prices. As noted in Oftel's *Review of the Charge Control on Calls to Mobiles* (2001), and in the CC report, these are likely to be effectively internalised by callers, as a high percentage of calls are from known parties and there are likely to be implicit or explicit agreements to split the origination of calls.

Vodafone

D.17 Vodafone rejects Oftel's economic reasoning in relation to the Rohlfs-Griffin[59] (R-G) factor, and states that it is 'purely and simply an empirical matter'. Vodafone also rejects Oftel's comments about the exclusion of unobserved taste effects, noting that the Frontier estimates contain time trends which were specifically designed to pick up such effects.

D.18 Vodafone also re-iterates its view that off-net minutes should be excluded from the denominator of the externality calculation (in relation to the CC estimate). Vodafone suggests Oftel's position – that the externality surcharge should not be solely levied on fixed-to-mobile calls – would be correct if all prices were to be adjusted by Oftel to their optimum levels, but as the industry generates no net revenue from termination of off-net calls, it cannot be assumed that MNOs can generate funds for targeting marginal subscribers from off-net mobile-to-mobile calls.

Ofcom's response

D.19 Ofcom rejects Vodafone's interpretation that *a priori* economic reasoning should be ignored when deriving the R-G factor. As noted in both the May and December consultations (see Annex G), empirically-estimated R-G factors of above two are simply implausible and strongly suggestive of estimation bias. The CC also agreed with this approach (see paragraph 2.372).

D.20 Ofcom has partially addressed Vodafone's point about off-net minutes in the December consultation (see paragraphs G.75-G.76), noting that, in principle, it would be more efficient to recover the surcharge across all mobile termination services (whether used for fixed-to-mobile or off-net mobile calls). Ofcom does not agree with Vodafone's further suggestion that higher termination charges for off-net calls will be 'revenue neutral' and will not provide more funds to subsidise marginal subscribers. Vodafone's interpretation would only be correct

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[59] The R-G factor (or gross externality factor) is the ratio of social benefit to private benefit. In this context, it provides a measure of the externalities associated with the addition of subscribers to a network. See Annex G of the December consultation for more detail.

if retail charges for off-net calls were invariant to the termination charge. However, Ofcom believes that higher termination charges are highly likely to feed into higher retail prices (because these charges form part of the marginal cost of a call, from the perspective of the originating operator). This implies that higher termination charges are likely to generate funds to subsidise marginal subscribers, and Ofcom therefore rejects Vodafone's argument that the CC calculation was incorrect because it excluded mobile-to-mobile call minutes.

Orange

D.21 Orange does not make any additional comments to those in response to the May Consultation, only noting that in its view the Director had chosen a surcharge at the extreme lower end of a reasonable range of estimates.

T-Mobile

D.22 T-Mobile states that five key assumptions underlying Oftel's analysis raise concern:

(a) the level of the R-G factor assumed;

(b) the ability of MNOs to target funds raised by a surcharge at marginal customers;

(c) whether the surcharge can be recovered from all mobile services;

(d) the assumed nature of retail competition; and

(e) whether the level of surcharge can be determined independently of the level of fixed and common costs.

Level of R-G Factor assumed

D.23 On point (a), T-Mobile claims that Oftel's assumption of 1.5 for the R-G factor implies that half of the external benefits generated by increasing mobile subscription are internalised, which is inconsistent with the CC's evidence.

D.24 It was the view of Oftel (see annex G.26-G.29, December Consultation) and the CC (see paragraphs 2.372) that reasonable bounds for the R-G were between 1 and 2, with R-G factors of over two being implausible. Similarly, both Oftel (see paragraph G.23, December consultation) and the CC (see paragraphs 2.350 and 2.374) concluded that a reasonable upper limit for the R-G factor in practice – that is, taking into account the likely gross externality factor and likely internalisation by consumers, was 1.5-1.7. This upper limit accounts for both the likelihood that the 'gross' externality factor is below 2, as well as allowing for some internalisation by consumers.

Ability to target funds on marginal customers

D.25 T-Mobile made a number of further sub-points on targeting. In particular, that:

- Oftel has regard to models which Rohlfs has rejected, and doesn't have regard to other results from Rohlfs which are not inconsistent with a surcharge of 2ppm (nor has Oftel sought to update the reasonable range in the Rohlfs model taking into account new cost information). (T-Mobile, part II, paragraph 75)

- Oftel does not provide any support for the assumption in its modelling that all of the termination surcharge raised will be spent on non-subscribing marginal customers. (T-Mobile, part II, paragraph 76)

- As a surcharge increases profitability of all customers, competition will force MNOs to use funds on all subscribers (i.e. including infra-marginal subscribers). MNOs will only bring on marginal customers if they are self-financing. (T-Mobile, part II, paragraph 77)

- Because subsidies are a transfer, Oftel's suggestion that limited targeting means that the subsidy should be lower is incorrect. There is no reason it should be small – it should be at the level which creates the optimal number of subscribers on mobile networks. T-Mobile, part II, paragraph 78)

D.26 The issue of targeting was extensively addressed in Annex G of the December consultation (which also contains references to earlier Oftel work and the CC report). While the majority of T-Mobile's points were already addressed in that consultation, some additional comments and clarifications are now added.

D.27 It is Ofcom's view that T-Mobile's statements regarding the use of the Rohlfs model are incorrect. Rohlfs rejects estimates of 2ppm that were derived using his model as not being the most reasonable.[60] Rohlfs also does not reject the results of his targeting model, merely noting that MNOs may not have the ability to price discriminate to the extent modelled in the 2 or 3 part pricing plans.[61] The Rohlfs model has also been updated to correct for revisions to the LRIC model, and is updated further for this Statement. The input values and parameters used in the December consultation were the same as those used in the cost-benefit analysis; see Annex L of the December consultation. In this Statement, these inputs have been further updated.

D.28 The estimates used in the December consultation to inform the judgement as to the appropriate surcharge made a number of different assumptions with respect to targeting. For example, the estimate from the "Rohlfs no targeting" model assumes a surcharge is set on all fixed-to-mobile calls and this is passed through as a lower average subscription charge for *all subscribers*. The Rohlfs targeting model estimates the surcharge under the assumption that subsidies can be targeted to separate marginal and infra-marginal subscribers. Both of these estimates form part of a range, reflecting that while it is unreasonable to assume no incentive or ability to target, it is also probably unreasonable to assume that all subsidies would be directed to marginal subscribers.

D.29 As indicated in the December consultation, if it was the case that the incentive to target was overstated, and the assumption that all or most of the surcharge

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[60] See Oftel, *Ramsey prices and Network Externalities: Dr Rohlfs' Analysis,* 23 May 2002, footnote 6.

[61] See Rohlfs, Response to the Competition Commission – Estimates of targeted subsidies, 19 June 2002, p. 5.

was spent on infra-marginal consumers was adopted, it would not lead to the conclusion that the surcharge should be increased. It may be that any subsidies that accrue to infra-marginal users are transfers – that is, of themselves they have no net welfare consequence – but there are clear adverse welfare consequences from the higher termination charges which must be raised to finance the (ever-larger) subsidies. Given these welfare losses, substantial wastage of the subsidy would therefore suggest that the subsidy should be reduced.[62]

Surcharge recovered from all services

D.30 On point (c), T-Mobile re-iterates the points made in its response to the May consultation, namely that the surcharge can not be levied on competitive services, as suggested in modelling.

"Competition does not permit MNOs suddenly to set their subscription and outgoing call charges higher so that they can generate a pool of funds to bring unprofitable customers onto their networks." (T-Mobile, part II, paragraph 79)

D.31 Again, this is an issue that Ofcom believes was addressed in the December consultation (paragraphs G.46-G.51). In determining the set of efficient Ramsey prices including externality effects, there is a trade-off between the benefits from effectively correcting for the externality (by subsidising the price of subscription) and raising the price of other services to fund the subsidy. This means that the 'second best' price for subscription will clearly be above the 'first best' price, in which the subsidy is assumed to be funded outside of the model. When considering questions of funding, it is more efficient to raise the price of all other services supplied by MNOs rather than just mobile termination.

D.32 Ofcom believes that T-Mobile has misinterpreted the modelling of the recovery of the surcharge across all services. In the "no targeting" model, once the first best price for subscription is determined, it is necessary for all prices to be marked up for common cost and subsidy recovery so that MNOs do not lose money. This result – that all prices will be higher than otherwise – is driven by efficient cost recovery and is independent of the level of competition between the MNOs. To see this, suppose that the optimal subsidies to marginal subscribers were provided (the first best). If the mark-up on call termination is then fixed by regulation, all MNOs will need to raise prices for these other services (including subscription) so as to ensure cost recovery. The results of the model are hence consistent with a competitive market in which Ramsey-type cost recovery principles are used.

Assumed nature of retail competition

D.33 On point (d), T-Mobile argues that the use of the estimate based on a 'principal-agent' model of regulation was inappropriate, as the model results

[62] T-Mobile's analysis of publicly-provided education or health, which is considered to be desirable even if it not targeted to those who could otherwise not afford to pay, is clearly lacking in the same respect. The Government in this instance would clearly need to consider whether the deadweight losses from higher tax revenue (which relate to the total size of the subsidy) are outweighed by benefits which accrue to less-well-off citizens.

run counter to market facts – with a market outcome of lower subscription and high call prices, rather than the other way around as predicted by the model.

D.34 The principal-agent model is designed to capture relevant features of MNO behaviour – in particular, their maximisation of the surplus accruing to their own subscribers, and not of subscribers (including fixed subscribers) in general. But this involves simplification of complex issues, for example, there is no distinction between the subscription or usage prices paid by different users. This model results in a lower optimal mark-up on mobile termination, as the model assumes MNOs will use higher mark-ups to lower usage prices to infra-marginal subscribers, rather than lowering subscription prices. Given the smaller subscription subsidy, the external benefits derived from a surcharge are lower and it is therefore optimal to have lower mark-ups. This is further addressed in the May consultation, page 216. While T-Mobile claims the outcomes of this model are not consistent with current market outcomes, T-Mobile suggests earlier in its submission (part II, paragraph 77) that it will use the additional revenue earned from a mobile termination mark-up to compete for infra-marginal customers. Further, while the average prices paid may appear different, the model takes no account of the price discrimination and non-linear pricing which is commonly practiced by the MNOs in the retail market (which leads to many different subscription and call charge combinations). Ofcom considers that the modelling of retail competition in the 'principal-agent' model is reasonable, although it accepts that this is a complex matter and other models of retail competition would be possible.

Whether the surcharge can be determined independently of common costs

D.35 On point (e), T-Mobile argues that Oftel underestimated the optimal surcharge by removing fixed costs from the Rohlfs model:

"In fact, Oftel will underestimate the appropriate surcharge if it chooses now to assume that there are no fixed and common costs when estimating the surcharge (i.e. by modelling the appropriate mark-ups separately). In particular, the existence of fixed and common costs implies a higher overall level of mobile prices (than if there were no such costs) and therefore a lower number of subscribers as the base from which to determine the appropriate externality surcharge. The lower initial subscriber base will imply a higher optimal externality surcharge than estimated by Oftel when it assumes there are no fixed or common costs in its externality modelling."

D.36 Before further discussion of this issue, it may be helpful to recap the approach taken in the May and December consultations, taking the Rohlfs model with no targeting of subsidies, i.e. with all subscribers paying the same price (the "no targeting" model) as the example. With the base case assumptions, this model yielded an optimal mark-up over LRIC for fixed-to-mobile retail calls of 0.77ppm. However, this mark-up included an allowance for the recovery of common costs as well as an adjustment for externalities. Ofcom has decided to use an EPMU approach to common costs (for reasons set out from paragraph 6.8 onwards). It has used the Rohlfs models to inform a reasonable figure for the externality surcharge, not the common cost mark-up. To 'strip out' the common cost recovery element, an amount equal to the EPMU (0.28ppm, leaving an optimal surcharge of 0.49ppm) was removed.

D.37 It was noted in the December consultation that the method used in the May consultation was imprecise, and a new method was developed. At the same time, adjustments were made to the cost inputs – in particular, common costs increased due to the inclusion of non-network common costs. These common cost adjustments led to a significant increase in the optimal mark-up (to around 1.5ppm), although as this was primarily driven by common cost adjustment, the effect on the mark-up for externalities was thought to be minimal. The new methodology effectively abstracted from the issue of mark-ups to recover common costs – that is, common costs were set to zero – and the optimal mark-up was then recalculated. The 'upper bound' mark-up was found to be 0.49ppm – the same as that previously used. The other reported mark-ups (in the table on page 1) were also recalculated using this approach.

D.38 In response to T-Mobile's comments, Ofcom has further examined its methodology and concluded that the level of common costs does have an influence on the optimal externality surcharge – although this influence is not straightforward, and depending on the circumstances, could change the surcharge in either direction. In the specific circumstances of the calculations in the December consultation, in which common costs were removed, Ofcom finds that it is likely that the optimal surcharge has been understated for two of the models (specifically in the "no targeting" model and the "less internalisation" models).

D.39 Ofcom's purpose in using the Rohlfs models is to inform the size of the externality surcharge, given that the EPMU approach is to be used for common cost recovery. Consequently, Ofcom has revised its approach to calculate the optimal mark-up for fixed-to-mobile calls by using as the cost inputs LRIC plus EPMU (with common costs set to zero). This approach ensures that all relevant costs to be recovered are included.

D.40 This approach leads to the following revisions to the estimates using the Rohlfs model. Again, these estimates have been re-calculated to take into account the latest available information on LRIC and common costs.

Table 2: Revised estimates

Source	***December surcharge***	***Revised surcharge***
Rohlfs targeting model	0.07ppm	0.06ppm
Rohlfs principal-agent model	0.07ppm	0.02ppm
Rohlfs no targeting model	0.49ppm	0.66ppm
Rohlfs model – reduced internalisation	0.67ppm	0.90ppm

D.41 It can be seen this leads to revisions of the December consultation estimates, in the first two models by small reductions, and in the latter two models by increases of around 0.2ppm.

D.42 This means that the previous figure of 0.4ppm appears below the midpoint of the estimates, whereas it had previously been above the midpoint. Taking into account the revised figures in Table 2, it is considered that an upwards revision is appropriate. Based on the revised figures, and the other figures in Table 1, Ofcom concludes that a surcharge of 0.5ppm is reasonable.

Conclusion

D.43 Ofcom considers that, broadly speaking, the estimates used in the previous consultations remain relevant to the decision about an appropriate externality surcharge. However, given the upwards revisions to two of these estimates, Ofcom believes it would be appropriate to allow an additional 0.1ppm for the externality surcharge. This takes the appropriate surcharge to 0.5ppm.

Annex E

The treatment of ported numbers

E.1 In the December consultation Ofcom proposed to exclude call minutes to ported-in numbers from the charge controls (see paragraphs 6.26 to 6.29 and Annex J of the December consultation). Ofcom remains of the view that this proposal is the most appropriate treatment of these calls. This section discusses Ofcom's position and its responses to the comments made to December consultation.

Arrangements for number portability

E.2 Number portability is the facility which allows subscribers of publicly available telephone services (including mobile services) to change their service provider whilst keeping their existing telephone number. Its purpose is to foster consumer choice and effective competition by enabling subscribers to switch between providers without the costs and inconvenience of changing telephone number. Mobile number portability was introduced in the UK in January 1999.

E.3 Under the current commercial arrangements for mobile number portability, calls to a ported number are routed via the 'donor' MNO (i.e. the MNO that first provided the customer with the telephone number) to the 'recipient' MNO (i.e. the MNO to which the customer has switched while retaining the original telephone number), which then receives the termination charge of the donor MNO (less a Donor Conveyance Charge kept by the donor[63]). Hence, calls to ported numbers are 'ported-in' from the perspective of the recipient network and 'ported-out' from the perspective of the donor network.

E.4 This arrangement, whereby the recipient operator receives a termination charge set by another MNO (the donor) which may have different charges, is the result of the technical routing system in place at present (i.e. the indirect routing system described above). This routing system does not enable the originating operator to identify the MNO on whose network the call actually terminates (i.e. the recipient MNO) and, thus, the originating operator pays the termination charge of the donor MNO to which it hands the call.

E.5 This charging arrangement generates gains or losses for the MNOs, depending on the relative levels of their termination charges – the termination charges of the 1800MHz MNOs, Orange and T-Mobile, are on average higher than those of the combined 900/1800MHz MNOs, O2 and Vodafone. The arrangement favours the MNOs with lower termination charges, which receives a higher charge on a share of their incoming traffic, and the reverse is true for those with higher termination charges. If the industry were to move to a direct routing system, in which the donor MNO played no role in the transmission of the call and recipient MNO could levy its termination charge on these calls, these gains and losses would disappear.

[63] This is the charge which, under the current arrangement, is paid by the recipient MNO to the donor MNO for the transit service of routing of the ported call. This charge covers the switching, engineering and transmission costs incurred by the donor MNO in conveying the call to the recipient MNO.

E.6 Ofcom has expressed a preference for a direct routing portability arrangement where prices reflect costs, as this would not generate the gains and losses noted above and would avoid the cost of an additional transmission leg (due to the routing via the donor network). Ofcom is currently considering the likely costs and benefits of migrating to a direct routing solution in the longer term, though with particular regard to fixed number portability rather than mobile (albeit many of the issues are likely to be similar). Ofcom expects to consult widely on its findings in the near future[64]. However, Ofcom is aware that the cost of setting up the central customer database necessary to support a direct routing system is likely to be high and, therefore, that direct routing may currently not be the most cost-efficient solution. Hence, currently Ofcom continues to be of the view that it is for the industry to decide if, and when, to move to an arrangement that better reflects costs on the basis of the costs and benefits of implementing a different, routing system. In the meantime, in considering how ported-in minutes should be treated in the charge control, Ofcom has assumed that the current technical and charging arrangements for mobile number portability are likely to remain in place in the short-to-medium term.

Calls to ported numbers and the charge controls

E.7 In the May consultation Ofcom expressed the view that the level of porting of mobile numbers has become significant enough to warrant proper consideration of how they should be treated in the charge controls (see paragraphs 7.33 and 7.34). It therefore proposed that the controls on the termination charges of each MNO should cover all calls terminated to handsets connected to the MNO's network, including calls to ported-in numbers. More details on this proposal, referred to as Option 1, can be found in Annex I of the May consultation. However, since this arrangement may render it difficult for the MNOs to comply exactly with their control[65], Ofcom also proposed that MNOs could request its consent to exclude call minutes to ported-in numbers from the charge control.

E.8 Having examined the issue further, in the December consultation Ofcom noted that including ported-in minutes and then allowing the MNOs to request their exclusion could result in an undesirable outcome. The combined 900/1800MHz MNOs, which have lower termination charges, may have the incentive to request Ofcom's consent for exclusion, as the inclusion of ported-in minutes (on some of which they receive higher termination charges from the 1800MHz MNOs) raises their AIC and would require them to set their own charges lower in order to comply with their TAC. On the other hand, the 1800MHz MNOs, which have higher termination charges, may have the incentive to retain in the control the lower termination charges of the combined 900/1800MHz MNOs

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[64] Ofcom published a *Consultation on proposals to change the framework for number portability* of June 2002 after the failure of Atlantic Telecom in which thousands of subscribers lost their telephone numbers. In its subsequent *Statement on proposals to change the framework for number portability* published in December 2002 Ofcom indicated that it would carry out an economic assessment of the costs and benefits of introducing a centralised database which would facilitate a direct routing solution.

[65] This is for two reasons. First, each MNO would need to forecast accurately the charges that all other MNOs set for termination during the forthcoming control year, since these would form part of its own AIC via ported-in minutes. In addition, even the knowledge of other MNOs' charges for the control year ahead would not be sufficient, as each MNO, to satisfy its cap exactly, would also need to know the weights in the other MNOs' caps.

received on some of the ported-in minutes because it would reduce their AIC, allowing them to set their own charges higher and still comply with their TAC. Overall, this would result in an inconsistent treatment of calls to ported numbers and a weakened set of charge controls, to the detriment of consumers.

E.9 Ofcom modified its proposal to address this concern and it suggested excluding call minutes to ported-in numbers from the charge controls (see paragraphs 6.26 to 6.29 and Annex J of the December consultation). However, Ofcom also proposed that it would be minded to include these call minutes in the controls if a concern arose that the MNOs might be reducing the effectiveness of the charge controls by setting excessive termination charges for calls to ported-in numbers.

E.10 Ofcom has not changed its view and intends to implement the proposal put forward in the December consultation. Given the current charging arrangements, Ofcom considers its December proposal to be the most appropriate treatment of calls to ported numbers. Whilst call minutes to ported numbers are not going to be included in the charge controls, Ofcom will monitor the behaviour of the MNOs and will be minded to include these minutes in the control if the MNOs set excessive termination charges for calls to ported-in numbers.

Responses to the consultation

E.11 O2 welcomes Ofcom's proposal, describing it as a "pragmatic decision to exclude ported in minutes from the charge controls easier to administer in practice".

E.12 Orange agrees with Ofcom's conclusion that including calls to ported-in numbers in the charge control could give rise to practical complications. However, it made the point that excluding them is not sufficient and that a solution should be found for the gains and losses generated by the current indirect routing system where the donor termination charge (D_t) applies for all ported-in minutes. Orange's proposal is to alter the charging arrangements to introduce a "combined system", where for certain categories of calls to ported-in numbers the recipient termination charge (R_t) is paid. Table 1 below describes Orange's proposed system and compares it with the current charging system.

Table 1: The current charging system for terminating calls to ported-in numbers and the "combined system" proposed by Orange

<table>
<tr><th colspan="2">Current charging system</th><th colspan="2">Orange's combined charging system</th></tr>
<tr><td>If $D_t = R_t$</td><td rowspan="3">the terminating operator receives D_t</td><td>If $D_t = R_t$</td><td rowspan="2">the terminating operator receives D_t</td></tr>
<tr><td>If $D_t < R_t$</td><td>If $D_t < R_t$</td></tr>
<tr><td>If $D_t > R_t$</td><td>If $D_t > R_t$</td><td>the terminating operator receives R_t</td></tr>
</table>

E.13 Orange's system implies that for a call to a number ported from a 1800MHz MNO to a combined 900/1800MHz MNO, where the donor termination charge is higher than the recipient one, the donor MNO would transfer an amount equal to the R_t and retain the difference between its termination charge and the recipient one (D_t - R_t). Whereas in the case of a call to a number ported from a combined 900/1800MHz MNO to a 1800MHz MNO, where the donor termination charge is lower than the recipient one, the recipient MNO would continue receiving the donor termination charge. However, in all cases the originating operator would pay the same termination charge (of the donor network) as under the current system.

E.14 Orange argues that this system would be more equitable than the current one as it would reduce the unearned losses[66] incurred by the 1800 MHz MNOs, which have higher termination costs. It also claims that the implementation of its suggested combined system would not require any changes to the MNOs' billing system, but only a simple data management amendment to adjust relevant charge classes in the interconnect billing system.

Ofcom's response

E.15 Ofcom considers that ideally the termination charges paid by the originating operators on calls to ported numbers should reflect the costs incurred by the terminating (and recipient) operators to complete the call. As discussed above, a disadvantage of the current system is that the originating operator does not always pay a charge that reflects the relevant cost of termination on the recipient network. However, Orange's "combined system" does not address this disadvantage, since the originating operator would pay the same termination charge (of the donor network) as under the current system (i.e. the reduction in the termination charge received by a recipient operator for some calls to ported-in numbers (when $D_t > R_t$) would not be reflected in the termination charge paid by the originating operators)[67].

[66] There would be no losses if the volumes of ported-in minutes between pairs of MNOs were equal.

[67] Under Orange's "combined system" the revenues (Dt-Rt) retained by the donor operator on calls to ported-out numbers (when Dt > Rt) only by chance allow the donor operator to recover the revenue lost when it receives a lower termination charge (i.e. when Dt < Rt) on calls to ported-in numbers. The revenues from ported-out numbers and the lost revenue from ported-in minutes depend on different and unrelated flows of traffic and, therefore, will be equal only when, these two flows are equal.

Annex F

Glossary

Bottom-up approach (to modelling of costs) – the calculation of costs by identifying and summarising the costs of the items of equipment, manpower and other resources required. Contrasts with top-down approach, which involves removing from a known total the costs which are not relevant to the activity in question.

Called party – a person who receives a call.

Calling party – a person who initiates a call.

Calling party pays ('CPP') – a system of charging for telecommunications services whereby the party that initiates the call (the 'calling party') pays for both the origination and termination of the call.

Call origination – see originating operator.

Voice call termination – see terminating operator.

CC (Competition Commission) - Formerly Monopolies and Mergers Commission.

Common costs – Costs that are incurred in the supply of all or a group of products or services provided by the company and that do not arise directly from the production of a single good or service.

Cost of capital – a firm's cost of capital can be defined as the rate of return that could be earned in the capital market on securities of equivalent risk. In general, the higher the riskiness of the firm's activities, the higher its cost of capital, since investors typically require compensation for greater risk. For a firm financed by debt and equity, the cost of capital will be a weighted average of its cost of capital from both sources.

Current Cost Accounting (CCA) – an accounting convention, where assets are valued and depreciated according to their current replacement cost whilst maintaining the operating or financial capital of the business entity.

Equal Proportionate Mark Up (EPMU) – a means of recovering fixed and common costs through the addition of a mark-up on top of incremental costs. The costs to be recovered are allocated across a range of services so that each service is allocated the same mark up as a percentage of its incremental cost.

Fixed Network Operators (FNO) – operators providing fixed as opposed to mobile telephony services.

FAC (Fully Allocated Costs) – a system of cost allocation based on HCA.

Fixed-to-mobile call – Calls originating on a fixed network and terminating on a mobile network.

Gateway MSC – Mobile switching centre acting as a point of entrance to and exit from a mobile network

GPRS (General Packet Radio Service) – an extension to GSM standard to include packet data services.

GSM (Global System for Mobile Communication) A European system for digital mobile phones.

GSM 900/1800 MHz – GSM in the 900 and 1800 MHz frequency bands.

HCA (**Historic Cost Accounting) –** a universally recognised accounting convention. Costs, turnover, assets and liabilities are generally recorded at the value when the transaction was incurred and where assets are valued and depreciated according to their cost at the time of purchase.

IP (Internet Protocol) – packet data protocol used for routing and carriage of messages across the Internet.

Long Run Incremental Cost (LRIC) – the cost caused by the provision of a defined increment of output given that costs can, if necessary, be varied and that some level of output is already produced.

MMC (Monopolies and Mergers Commission) – Now renamed the Competition Commission).

MNO (Mobile Network Operator) – Vodafone, O2, Orange, T-Mobile, '3' or Inquam.

Mobile number portability – where a customer taking a service from a mobile operator (eg Vodafone, Orange) or service provider (eg People's Phone) can retain their telephone number when they change to a different mobile operator or service provider.

Mobile-to-mobile call - Call originating and terminating on a mobile network (see also 'on-net' 'and off-net').

MVNO (**Mobile Virtual Network Operator**) – an organisation which provides mobile telephony services to its customers, but does not have allocation of spectrum.

Network Externality – the effect on a third party when a person decides to become a new subscriber to a network which is not taken into account when this decision is made. In this case the third party values the calls that they make to and receive from the new subscriber.

Off-net call – mobile-to-mobile call from one mobile network and terminating on a different mobile network.

On-net call – mobile-to-mobile call from one mobile network and terminating on the same mobile network.

Originating network – the network to which a caller who makes a call is directly connected.

Originating operator – operator on whose network the call originates, i.e. the operator to whom the customer subscribes.

Outpayments – these are the payments made by one network operator to another for the purpose of conveying messages between the two systems.

PCN (Personal Communications Network) – high capacity digital cellular networks (Orange and One2One are the current UK PCN operators).

PSTN (Public Switched Telephony Network) – the telecommunications networks of the major operators, on which calls can be made to all customers of the PSTN.

Ramsey Pricing – a method by which firms can recover fixed and common costs which allows maximisation of economic welfare.

Receiving party pays (RPP) – a system of charging for telecommunications services whereby the party that receives the calls (the 'receiving party') pays for the termination of the call (and possibly also for origination).

Second Generation (2G) – 2G means spectrum within the 880–915 MHz, 925–960 MHz, 1710–1785 MHz or 1805–1880 MHz bands.

Short but significant non-transitory increase in price ('SNIPP') test – Hypothetical monopoly test used in market definition analysis

SIM (Subscriber Identity Module) – A small smart card type device that has details of the mobile subscriber including public telephone number and the numbers required by the network to recognise and authenticate the subscriber.

SMS (Short Messaging Service) – facility to send text messages of up to 160 alphanumeric characters between compatible devices.

Stand-alone costs – the costs to a single product firm of providing a service. The stand-alone costs of a service exceed the incremental costs to a multi-product firm if there are economies of scope.

Terminating network – the network to which a customer who receives a call is directly connected.

Terminating operator – the operator on whose network the call terminates.

TETRA – Terrestrial Trunked Radio, a modern digital Private Mobile Radio technology.

Third Generation (3G) mobile systems – 3G mobile communications system will provide an enhanced range of multimedia services (e.g. video, high speed Internet access). The first 3G networks are expected to entered service in 2003 using radio spectrum in the 2GHz bands.

UMTS (Universal Mobile Telecommunications System) – 3G mobile communications system which provides enhanced range of multimedia services (e.g. video, high speed Internet access).

Voice over IP (VoIP) – the conveying of voice messages over Internet Protocol.

Annex G

NOTICE TO 02 (UK) LIMITED UNDER PARAGRAPH 9 OF SCHEDULE 18 TO THE COMMUNICATIONS ACT 2003

Notice that certain continued provisions set out in the continuation notice given to O2 (UK) Limited on 23 July 2003 will cease to have effect from the date this notice is deemed to be effected in accordance with section 7 of the Interpretation Act 1978 and section 394(7) of the Communications Act 2003 or from 2 September 2004 (whichever is stated to be applicable)

1. The Office of Communications ('Ofcom'), in accordance with Paragraph 9(9) of Schedule 18 to the Communications Act 2003 ('the Act') hereby give notice to O2 (UK) Limited ('O2') that certain continued provisions contained in Schedule 1 to the continuation notice given to O2 on 23 July 2003, which had effect from 25 July 2003, ('the Continuation Notice'), will cease to have effect from the date this notice is deemed to be effected in accordance with section 7 of the Interpretation Act 1978 and section 394(7) of the Act or from 2 September 2004 (whichever is stated to be applicable), to the extent set out in Schedule 1 to this notice ('the Discontinued Provisions'). As set out in Schedule 1 Conditions 70B and 70C will cease to have effect from 2 September 2004, that being the day after the date on which the SMP conditions, which will be set for the purpose of replacing those continued provisions by way of the Notification published by Ofcom on 1 June 2004, shall come into force.

2. In giving this notice, Ofcom have, in accordance with Paragraph 9 (11) of Schedule 18 to the Act, taken all steps necessary for enabling them to decide whether or not to set a condition under Chapter 1 of Part 2 of the Act for the purpose of replacing the continued provisions and whether or not to exercise their power to set a condition under that Chapter for that purpose.

3. All directions, determinations, consents and other provisions which were continued under the Continuation Notice by virtue of Paragraph 9(8) of Schedule 18 to the Act will also cease to have effect from the date this notice is deemed to be effected in accordance with section 7 of the Interpretation Act 1978 and section 394(7) of the Act or from 2 September 2004 (whichever is stated to be applicable), to the extent that they were given or made for the purposes of the Discontinued Provisions.

4. To the extent that the Continuation Notice does not cease to have effect under Paragraph 1 of this notice, the Continuation Notice shall continue to have effect until Ofcom have given a further notice to O2 in accordance with Paragraph 9(9) of Schedule 18 to the Act that it shall cease to have effect.

5. The Director General of Telecommunications issued a consultation as to his proposals to discontinue the Discontinued Provisions on 2 October 2003 and requested comments by 9.00 a.m. on 16 October 2003. Ofcom have taken into account the comments received during that consultation.

6. In this notice, except as otherwise provided or unless the context otherwise requires, words or expressions shall have the meaning assigned to them and otherwise any word or expression shall have the same meaning as it has in the Act. For the purposes of interpreting this notice, headings and titles shall be disregarded.

Philip Rutnam

A person authorised by Ofcom under paragraph 18 of the Schedule to the Office of Communications Act 2002
28 May 2004

Schedule 1

The following continued provisions which were contained in Schedule 1 to the Continuation Notice will cease to have effect from the date this notice is deemed to be effected in accordance with section 7 of the Interpretation Act 1978 and section 394(7) of the Act, to the extent set out in paragraph (a) below-

(a) Conditions 45, 47, 48 and 49 in so far as those conditions relate to the markets which have been reviewed in the review of Wholesale Mobile Voice Call Termination (‘the Market Review’) and which will be replaced by SMP conditions imposed on O2 by way of the Notification (‘the Notification’) set out in Annex A of the Market Review published by Ofcom on 1 June 2004.

The following continued provisions which were contained in Schedule 1 to the Continuation Notice will cease to have effect from 2 September 2004, to the extent set out in paragraph (b) below-

(b) Conditions 70B and 70C in so far as those conditions relate to the markets which have been reviewed in the Market Review and which will be replaced by SMP Conditions imposed on O2 by way of the Notification.

NOTICE TO ORANGE PERSONAL COMMUNICATIONS SERVICES LIMITED UNDER PARAGRAPH 9 OF SCHEDULE 18 TO THE COMMUNICATIONS ACT 2003

Notice that certain continued provisions set out in the continuation notice given to Orange Personal Communications Services Limited on 23 July 2003 will cease to have effect from 2 September 2004

1. The Office of Communications (‘Ofcom’), in accordance with Paragraph 9(9) of Schedule 18 to the Communications Act 2003 (‘the Act’) hereby give notice to Orange Personal Communications Services Limited (‘Orange’) that certain continued provisions contained in Schedule 1 to the continuation notice given to Orange on 23 July 2003, which had effect from 25 July 2003, ('the Continuation Notice'), will cease to have effect from 2 September 2004, to the extent set out in Schedule 1 to this notice (‘the Discontinued Provisions’). The Discontinued Provisions will cease to have effect from 2 September 2004, that being the day after the date on which the SMP conditions, which will be set for the purpose of replacing the Discontinued Provisions by way of the Notification published by Ofcom on 1 June 2004, shall come into force.

2. In giving this notice, Ofcom have, in accordance with Paragraph 9 (11) of Schedule 18 to the Act, taken all steps necessary for enabling them to decide whether or not to set a condition under Chapter 1 of Part 2 of the Act for the purpose of replacing the continued provisions and whether or not to exercise their power to set a condition under that Chapter for that purpose.

3. All directions, determinations, consents and other provisions which were continued under the Continuation Notice by virtue of Paragraph 9(8) of Schedule 18 to the Act will also cease to have effect from 2 September 2004, to the extent that they were given or made for the purposes of the Discontinued Provisions.

4. To the extent that the Continuation Notice does not cease to have effect under Paragraph 1 of this notice, the Continuation Notice shall continue to have effect until Ofcom have given a further notice to Orange in accordance with Paragraph 9(9) of Schedule 18 to the Act that it shall cease to have effect.

5. The Director General of Telecommunications issued a consultation as to his proposals to discontinue the Discontinued Provisions on 2 October 2003 and requested comments by 9.00 a.m. on 16 October 2003. Ofcom have taken into account the comments received during that consultation.

6. In this notice, except as otherwise provided or unless the context otherwise requires, words or expressions shall have the meaning assigned to them and otherwise any word or expression shall have the same meaning as it has in the Act. For the purposes of interpreting this notice, headings and titles shall be disregarded.

Philip Rutnam

A person authorised by Ofcom under paragraph 18 of the Schedule to the Office of Communications Act 2002
28 May 2004

Schedule 1

The following continued provisions which were contained in Schedule 1 to the Continuation Notice will cease to have effect from 2 September 2004, to the extent set out below.

Conditions 70A and 70B in so far as those conditions relate to the markets which have been reviewed in the review of Wholesale Mobile Voice Call Termination ('the Market Review') and which will be replaced by SMP Conditions imposed on Orange by way of the Notification set out in [Annex A] of the Market Review published by Ofcom on 1 June 2004.

NOTICE TO T-MOBILE (UK) LIMITED UNDER PARAGRAPH 9 OF SCHEDULE 18 TO THE COMMUNICATIONS ACT 2003

Notice that certain continued provisions set out in the continuation notice given to T-Mobile (UK) Limited on 23 July 2003 will cease to have effect from 2 September 2004

1. The Office of Communications (‘Ofcom’), in accordance with Paragraph 9(9) of Schedule 18 to the Communications Act 2003 (‘the Act’) hereby give notice to T-Mobile (UK) Limited (‘T-Mobile’) that certain continued provisions contained in Schedule 1 to the continuation notice given to T-Mobile on 23 July 2003, which had effect from 25 July 2003, ('the Continuation Notice'), will cease to have effect from 2 September 2004, to the extent set out in Schedule 1 to this notice (‘the Discontinued Provisions’). The Discontinued Provisions will cease to have effect from 2 September 2004, that being the day after the date on which the SMP conditions, which will be set for the purpose of replacing the Discontinued Provisions by way of the Notification published by Ofcom on 1 June 2004, shall come into force.

2. In giving this notice, Ofcom have, in accordance with Paragraph 9 (11) of Schedule 18 to the Act, taken all steps necessary for enabling them to decide whether or not to set a condition under Chapter 1 of Part 2 of the Act for the purpose of replacing the continued provisions and whether or not to exercise their power to set a condition under that Chapter for that purpose.

3. All directions, determinations, consents and other provisions which were continued under the Continuation Notice by virtue of Paragraph 9(8) of Schedule 18 to the Act will also cease to have effect from 2 September 2004, to the extent that they were given or made for the purposes of the Discontinued Provisions.

4. To the extent that the Continuation Notice does not cease to have effect under Paragraph 1 of this notice, the Continuation Notice shall continue to have effect until Ofcom have given a further notice to T-Mobile in accordance with Paragraph 9(9) of Schedule 18 to the Act that it shall cease to have effect.

5. The Director General of Telecommunications issued a consultation as to his proposals to discontinue the Discontinued Provisions on 2 October 2003 and requested comments by 9.00 a.m. on 16 October 2003. Ofcom have taken into account the comments received during that consultation.

6. In this notice, except as otherwise provided or unless the context otherwise requires, words or expressions shall have the meaning assigned to them and otherwise any word or expression shall have the same meaning as it has in the Act. For the purposes of interpreting this notice, headings and titles shall be disregarded.

Philip Rutnam

A person authorised by Ofcom under paragraph 18 of the Schedule to the Office of Communications Act 2002
28 May 2004

Schedule 1

The following continued provisions which were contained in Schedule 1 to the Continuation Notice will cease to have effect from 2 September 2004, to the extent set out below.

Conditions 70A and 70B in so far as those conditions relate to the markets which have been reviewed in the review of Wholesale Mobile Voice Call Termination ('the Market Review') and which will be replaced by SMP Conditions imposed on T-Mobile by way of the Notification set out in [Annex A] of the Market Review published by Ofcom on 1 June 2004.

NOTICE TO VODAFONE LIMITED UNDER PARAGRAPH 9 OF SCHEDULE 18 TO THE COMMUNICATIONS ACT 2003

Notice that certain continued provisions set out in the continuation notice given to Vodafone Limited on 23 July 2003 will cease to have effect from the date this notice is deemed to be effected in accordance with section 7 of the Interpretation Act 1978 and section 394(7) of the Communications Act 2003 or from 2 September 2004 (whichever is stated to be applicable)

1. The Office of Communications ('Ofcom'), in accordance with Paragraph 9(9) of Schedule 18 to the Communications Act 2003 ('the Act') hereby give notice to Vodafone Limited ('Vodafone') that certain continued provisions contained in Schedule 1 to the continuation notice given to Vodafone on 23 July 2003, which had effect from 25 July 2003, ('the Continuation Notice'), will cease to have effect from the date this notice is deemed to be effected in accordance with section 7 of the Interpretation Act 1978 and section 394(7) of the Act or from 2 September 2004 (whichever is stated to be applicable), to the extent set out in Schedule 1 to this notice ('the Discontinued Provisions'). As set out in Schedule 1 Conditions 70B and 70C will cease to have effect from 2 September 2004, that being the day after the date on which the SMP conditions, which will be set for the purpose of replacing those continued provisions by way of the Notification published by Ofcom on 1 June 2004, shall come into force.

2. In giving this notice, Ofcom have, in accordance with Paragraph 9 (11) of Schedule 18 to the Act, taken all steps necessary for enabling them to decide whether or not to set a condition under Chapter 1 of Part 2 of the Act for the purpose of replacing the continued provisions and whether or not to exercise their power to set a condition under that Chapter for that purpose.

3. All directions, determinations, consents and other provisions which were continued under the Continuation Notice by virtue of Paragraph 9(8) of Schedule 18 to the Act will also cease to have effect from the date this notice is deemed to be effected in accordance with section 7 of the Interpretation Act 1978 and section 394(7) of the Act or from 2 September 2004 (whichever is stated to be applicable), to the extent that they were given or made for the purposes of the Discontinued Provisions.

4. To the extent that the Continuation Notice does not cease to have effect under Paragraph 1 of this notice, the Continuation Notice shall continue to have effect until Ofcom have given a further notice to Vodafone in accordance with Paragraph 9(9) of Schedule 18 to the Act that it shall cease to have effect.

5. The Director General of Telecommunications issued a consultation as to his proposals to discontinue the Discontinued Provisions on 2 October 2003 and requested comments by 9.00 a.m. on 16 October 2003. Ofcom have taken into account the comments received during that consultation.

6. In this notice, except as otherwise provided or unless the context otherwise requires, words or expressions shall have the meaning assigned to them and otherwise any word or expression shall have the same meaning as it has in the Act. For the purposes of interpreting this notice, headings and titles shall be disregarded.

Philip Rutnam

A person authorised by Ofcom under paragraph 18 of the Schedule to the Office of Communications Act 2002
28 May 2004

Schedule 1

The following continued provisions which were contained in Schedule 1 to the Continuation Notice will cease to have effect from the date this notice is deemed to be effected in accordance with section 7 of the Interpretation Act 1978 and section 394(7) of the Act, to the extent set out in paragraph (a) below-

(a) Conditions 45, 47, 48 and 49 in so far as those conditions relate to the markets which have been reviewed in the review of Wholesale Mobile Voice Call Termination (‘the Market Review’) and which will be replaced by SMP conditions imposed on Vodafone by way of the Notification (‘the Notification’) set out in Annex A of the Market Review published by Ofcom on 1 June 2004.

The following continued provisions which were contained in Schedule 1 to the Continuation Notice will cease to have effect from 2 September 2004, to the extent set out in paragraph (b) below-

(b) Conditions 70B and 70C in so far as those conditions relate to the markets which have been reviewed in the Market Review and which will be replaced by SMP Conditions imposed on Vodafone by way of the Notification.

NOTICE TO VODAFONE LIMITED, NTL LIMITED AND MCI WORLDCOM LIMITED UNDER PARAGRAPH 22 OF SCHEDULE 18 TO THE COMMUNICATIONS ACT 2003

Notice that the "Direction under Regulation 6(6) of the Telecommunications (Interconnection) Regulations 1997 relating to a dispute between Vodafone Limited and both ntl Limited and MCI Worldcom Limited over Vodafone Limited's credit vetting clause" made on 16 July 2003 will be revoked with effect from the date this notice is deemed to be effected in accordance with section 7 of the Interpretation Act 1978 and section 394(7) of the Communications Act 2003

1. The Office of Communications ("Ofcom"), in accordance with paragraph 22(8) of Schedule 18 to the Communications Act 2003 (the "Act") hereby gives notice to Vodafone Limited ("Vodafone"), ntl limited ("ntl") and MCI Worldcom Limited ("MCI") that the "Direction under Regulation 6(6) of the Telecommunications (Interconnection) Regulations 1997 relating to a dispute between Vodafone and both ntl and MCI over Vodafone Limited's credit vetting clause" made on 16 July 2003 and which was continued by the continuation notice given to Vodafone, ntl and MCI on 21 July 2003 ("the Continued Interconnection Direction"), will be revoked with effect from the date this notice is deemed to be effected in accordance with section 7 of the Interpretation Act 1978 and section 394(7) of the Act.

2. In giving this notice, Ofcom have, in accordance with paragraph 22(10) of Schedule 18 to the Act, taken all steps necessary for enabling them to decide whether or not to set a condition under Chapter 1 of Part 2 of the Act for the purpose of replacing the Continued Interconnection Direction and whether or not to exercise their power to set a condition under that Chapter for that purpose.

3. The Director General of Telecommunications issued a consultation as to his proposals to revoke the Continued Interconnection Direction on 2 October 2003 and requested comments by 9 a.m. on 16 October 2003. Ofcom have taken into account the comments received during that consultation.

4. In this notice, except as otherwise provided or unless the context otherwise requires, words or expressions shall have the meaning assigned to them and otherwise any word or expression shall have the same meaning as it has in the Act. For the purposes of interpreting this notice, headings and titles shall be disregarded.

Philip Rutnam

A person authorised by Ofcom under paragraph 18 of the Schedule to the Office of Communications Act 2002
28th May 2004