Vodafone's Undertaking in relation to the Domestic Digital Mobile Terminating Access Service

Discussion Paper

February 2005

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1. Preface

Vodafone Network Pty Ltd and Vodafone Australia Ltd (together Vodafone) lodged an ordinary access undertaking (the Undertaking), pursuant to Division 5 Part XIC of the *Trade Practices Act 1974* (the Act) with the Australian Competition and Consumer Commission (the Commission) on 26 November 2004. The Undertaking specifies certain terms and conditions upon which Vodafone undertakes to meet its standard access obligations to supply the domestic digital mobile terminating access service (MTAS).

Under Part XIC of the Act, the Commission must accept or reject the Undertaking. The process the Commission will follow to assess the Undertaking will be open and public, allowing parties to express their views and provide relevant information to the Commission.

As well as lodging the Undertaking, Vodafone has also provided a submission to the Commission in support of the Undertaking. Vodafone has provided both public and confidential versions of this submission to the Commission. The public version is currently displayed on the Commission's website.

Interested parties who wish to obtain access to the confidential versions of Vodafone's submissions should contact the Commission.

The Commission seeks submissions from interested parties on the Undertaking by no later than six weeks from the date upon which Vodafone makes certain relevant information reasonably available for industry assessment, being information that is contained in Vodafone's confidential submissions in support of the Undertaking. The Commission will notify on its website when this confidential information has been made reasonably available by Vodafone, and of the resulting closing date for submissions. The Commission will consider these submissions in deciding whether to accept or reject the Undertaking.

Vodafone has indicated to the Commission that it is willing to establish a confidentiality regime for access to certain information confidential to Vodafone.

Please forward submissions to:

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Interested parties who make written submissions should also provide submissions in electronic format.

The Commission will treat all submissions it receives as public, and will place written submissions on its website, unless an interested party specifically indicates to the Commission that it wishes to claim confidentiality in relation to all or part of a submission.

Parties who wish to claim confidentiality in relation to part of a submission should provide the Commission with both a confidential and public version of their submission. The public version should clearly indicate which parts are confidential. Any queries in relation to this discussion paper should be directed to Richard York on 03 9290 1883 or via the contact details provided earlier in this discussion paper.

2. Introduction

2.1 Declaration of the Domestic Digital Mobile Terminating Access Service (MTAS)

Part XIC of the Act establishes a regime for governing access to certain services in the telecommunications industry. Under Part XIC, providers of an active declared service (access providers) have an obligation to supply that service.

On 30 June 2004, the Commission decided to allow the existing GSM and CDMA terminating access service declaration to expire, and replaced it with a new declaration under s. 152AL of the Act. The new declaration provided an amended description of the mobile terminating access service that included voice services terminating on all digital mobile telephony networks.

On the same date, the Commission also determined pricing principles for the MTAS (the Pricing Principles), as it is required to under the Act. These Pricing Principles stipulate that the price of the MTAS should follow an adjustment path such that there is a closer association of the price and underlying cost (i.e. TSLRIC+) of the service.

As part of this Pricing Principle, the Commission also specified price related terms and conditions of access. These can be found at Annexure 2 to the Pricing Principle determination. These price related terms and conditions set out indicative prices that the Commission believes should apply with respect to the MTAS. The price of access to the MTAS for the periods specified in Column 1 of Table 2.1 is as specified in Column 2.

Table 2.1: Price related terms and conditions relating to access to the MTAS

Column 1	Column 2
1 July 2004 – 31 December 2004	**21 cpm**
1 January 2005 - 31 December 2005	**18 cpm**
1 January 2006 - 31 December 2006	**15 cpm**
1 January 2007 – 30 June 2007	**12 cpm**

The Commission noted at the time that the Pricing Principle (and the price related terms and conditions) are not binding. Where the Commission is required to make an arbitral determination, or consider an undertaking provided to it, in relation to the MTAS, a party may argue against the application of the Pricing Principle and the indicative prices set out in the price-related terms and conditions. In these circumstances, the Commission will have regard to the particular circumstances and

the information before it at that time in deciding whether or not to apply the the Pricing Principle and the price related terms and conditions.

2.2 Lodgement of Optus's Access Undertaking

SingTel Optus Pty Limited (Optus) have also lodged an ordinary access undertaking with the Commission, on 24 December 2004. The Commission's Discussion Paper in relation to Optus's undertaking may also be obtained from the Commission's website.

2.3 Access disputes in relation to the MTAS

The Commission has been notified of six access disputes in relation to the MTAS. PowerTel Limited (PowerTel) and Telstra Corporation Limited (Telstra) have notified the Commission of access disputes with Optus, while Hutchison 3G Australia Pty Ltd (H3GA), PowerTel, AAPT Limited (AAPT) and Telstra have notified the Commission of access disputes with Vodafone.

The resolution of access disputes is dealt with by Division 8 of Part XIC of the Act. Section 152CLA of the Act provides that if the Commission receives an access undertaking that relates, in whole or in part, to a matter that is the subject of an access dispute that has been notified to the Commission, the Commission may defer consideration of the access dispute, in whole or in part, while the Commission considers the access undertaking.

Furthermore, s. 152CGB provides that a determination made by the Commission under Division 8 has no effect to the extent to which it is inconsistent with an access undertaking that is in operation.

Similarly, if an access undertaking given by a carrier or provider is in operation, the Commission must not (in arbitrating an access dispute) make a determination that is inconsistent with the undertaking.

Given that the legislation contemplates that arbitrations be conducted in private, the ACCC will not be making any public comment about the specific MTAS access disputes before it, at this stage.

3. The role of undertakings, and the legislative criteria for the assessment of undertakings

Under Part XIC of the Act, the Commission may declare carriage services and related services to be declared services. Carriers and carriage service providers who provide declared services are required to comply with standard access obligations ("SAOs") in relation to those services. The SAOs facilitate the supply of declared services by access providers to access seekers, in order that access seekers can provide carriage services and/or content services.

Section 152AY(2) of the Act (detailed below) specifies the way the terms and conditions upon which the access provider must comply with the SAOs are determined.

> The carrier or carriage service provider must comply with the obligations:
>
> (a) on such terms and conditions as are agreed between the following parties:
>
> (i) the carrier or carriage service provider, as the case requires;
> (ii) the access seeker; or
>
> (b) failing agreement:
>
> (i) if an access undertaking given by the carrier or carriage service provider is in operation and specifies terms and conditions about a particular matter – on such terms and conditions relating to that matter as are set out in the undertaking; or
> (ii) if an access undertaking given by the carrier or carriage service provider is in operation, but the undertaking does not specify terms and conditions about a particular matter – on such terms and conditions relating to that matter as are determined by the Commission under Division 8 (which deals with arbitration of disputes about access); or
> (iii) if there is no such undertaking – on such terms and conditions as are determined by the Commission under Division 8 (which deals with arbitration of disputes about access).

3.1 Legislative criteria

Section 152BV of the Act sets out the obligations of the Commission in assessing an undertaking.

> (1) This section applies if:
>
> (a) an ordinary access undertaking is given to the Commission by a carrier or a carriage service provider; and
> (b) the undertaking does not adopt a set of model terms and conditions set out in an approved telecommunications access code.
>
> (2) The Commission must not accept the undertaking unless:
>
> (a) the Commission has:
>
> (i) published the undertaking and invited people to make submissions to the Commission on the undertaking; and
> (ii) considered any submissions that were received within the time limit specified by the Commission when it published the undertaking; and

(b) the Commission is satisfied that the undertaking is consistent with the standard access obligations that are applicable to the carrier or provider; and

(c) if the undertaking deals with a price or a method of ascertaining a price – the Commission is satisfied that the undertaking is consistent with any Ministerial pricing determination; and

(d) the Commission is satisfied that the terms and conditions specified in the undertaking are reasonable; and

(e) the expiry time of the undertaking occurs within 3 years after the date on which the undertaking comes into operation.

3.2 Publication of undertaking and invitation to make submissions

The Commission published the Undertaking, and public versions of Vodafone's submissions in support of it, on its website at www.accc.gov.au, on 1 December 2004.

The Commission now invites submissions on any aspect of the Undertaking and/or the submissions in support of it.

3.3 Consideration of submissions from interested parties

The time limit specified by the Commission for the receipt of submissions on the undertaking is no later than 6 weeks from the date upon which Vodafone makes certain relevant information reasonably available for industry assessment, being information that is contained in Vodafone's confidential submissions in support of the Undertaking. The Commission will notify on its website when this confidential information has been made reasonably available by Vodafone, and of the resulting closing date for submissions. The Commission will consider these submissions in deciding whether to accept or reject the Undertaking.

Vodafone has indicated to the Commission that it is willing to establish a confidentiality regime for access to certain information confidential to Vodafone.

Parties are required to provide any submissions that they intend to make to the Commission by no later than that date. As discussed below, parties are encouraged to provide their submissions at the earliest possible opportunity.

3.4 Consistency with standard access obligations

The standard access obligations (SAOs) are set out in s.152AR of the Act. Subject to class or individual exemptions made by the Commission, a carrier or carriage service provider must comply with the SAOs in regard to declared services it supplies either to itself or to other persons.[1] In particular, s.152AR requires access providers to, among other things:

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[1] Refer to ss.152AS and 152AT of the Act.

- supply an active declared service if requested to do so by a service provider (subject to certain limitations) and to take all reasonable steps to ensure that the technical and operational quality of the active declared service supplied to the service provider is equivalent to that which the access provider provides to itself;
- permit the interconnection of the facilities an access provider either owns, controls or is responsible for, with the facilities of a service provider for the purpose of enabling the service provider to be supplied with active declared services;
- take all reasonable steps to ensure that the technical and operational quality and timing of the interconnection is equivalent to that which the access provider provides to itself and is compliant with any technical standards in force under section 384 of the *Telecommunications Act 1997*; and
- provide billing information (if requested by the service provider) at certain intervals and in a certain manner and form.

The Commission will assess whether the Undertaking, including the service descriptions, are consistent with the SAOs.

3.5 Consistency with Ministerial pricing determination

Division 6 of Part XIC provides that the Minister can make a written determination setting out principles dealing with price or a method of ascertaining price relating to the SAOs. Section 152CI(1) of the Act provides that if a provision of an access undertaking is inconsistent with any Ministerial pricing determination, the provision will have no effect to the extent of the inconsistency.

The Minister has not made a pricing determination in relation to the MTAS.

3.6 Reasonable terms and conditions

An important part of the access regime is the terms and conditions of access (including the price or a method for ascertaining the price). Under Part XIC of the Act, the Commission cannot accept an undertaking unless it is satisfied that the terms and conditions specified are reasonable. In determining whether terms and conditions are reasonable, the Commission must have regard to the following matters:

- whether the terms and conditions promote the long term interests of end-users (the LTIE);
- the legitimate business interests of the carrier or carriage service provider concerned, and the carrier’s or carriage service provider’s investment in facilities used to supply the declared service concerned;
- the interests of persons who have rights to use the declared service concerned;
- the direct costs of providing access to the declared service concerned;
- the operational and technical requirements necessary for the safe and reliable operation of a carriage service, a telecommunications network or a facility; and

- the economically efficient operation of a carriage service, a telecommunications network or a facility.[2]

This does not, by implication, limit the matters to which regard may be had.[3]
In considering whether the terms of an access undertaking promote the LTIE, the Commission must consider the achievement of the following objectives:

- promoting competition in markets for telecommunications services;
- achieving any-to-any connectivity in relation to carriage services that involve communication between end-users; and
- encouraging the economically efficient use of, and the economically efficient investment in, the infrastructure by which telecommunications services are supplied.[4]

3.7 Expiry date and the term of the Undertaking

Should the Commission accept the Undertaking, it will commence operation from the date of its acceptance by the Commission, and will continue until the earlier of:

- 31 December 2007; or
- termination, withdrawal or replacement of the Undertaking in accordance with the Act.

The Commission notes that the Undertaking is of no effect in respect of the period that precedes any acceptance by the Commission, and may be withdrawn by Vodafone before its expiry date.

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2 Sub-section 152AH(1) of the Act.

3 Sub-section 152AH(2) of the Act.

4 Sub-section 152AB(2) of the Act.

4. The Commission's process for assessing the Undertaking

The process the Commission will follow to assess the Undertaking will be as open and public as practicable, allowing parties to express their views on the Undertaking, provide relevant information to assist the Commission. The process will also allow comment on preliminary views formed by the Commission and its analysis of the Undertaking.

The Commission intends to adopt the following process in assessing Vodafone's Undertaking.

Stage 1: Publish the undertaking and seek submissions

As stated above, the Commission has published the Undertaking, and public versions of Vodafone's submissions in support of it.

This discussion paper aims to inform parties of the matters the Commission must take into consideration in assessing the undertaking, and the issues which the Commission would particularly like addressed in submissions. This discussion paper is available on the Commission's web site at www.accc.gov.au.

As indicated in section 3, the time period for interested parties to make submissions to the Commission in relation to the Undertaking is by no later than 6 weeks from the date upon which Vodafone makes certain relevant information reasonably available for industry assessment, being information that is contained in Vodafone's confidential submissions in support of the Undertaking. The Commission will notify on its website when this confidential information has been made reasonably available by Vodafone, and of the resulting closing date for submissions.

The Commission has set the consultation period on this basis to better ensure that interested parties will be in a position to assess the Undertaking and make submissions on it.

While the Commission will, as required, have regard to all submissions that are made to it on or before the closing date for submissions, the Commission strongly encourages all interested parties to make their submissions as soon as they are in a position to do so. In particular, the Commission requests that should a party intend to make a submission on any matter not addressed in this discussion paper, it notify the Commission of its intentions as soon as possible.

The Commission also encourages parties to make their submissions in a way that facilitates the efficient assessment of their various contentions, including the verification of any facts or data upon which those contentions are based. In this regard, parties are encouraged to restrict confidentiality claims to a minimum and to establish appropriate confidentiality regimes for the disclosure of any information that is claimed to be confidential, to allow a critical assessment of their submissions. Accordingly, the Commission recommends that a party intending to provide confidential material in support of a submission, put in place pro forma

documentation to facilitate the prompt disclosure of that material to appropriate third parties.

Should the Commission not be in a position to efficiently assess a party's contentions, including by receiving the results of independent critical assessments of the contentions, it will be necessarily constrained in the weight to which it will be able to attach to those contentions. This will particularly be the case where conflicting material that has been critically assessed is before the Commission.

Stage 2: Publish draft assessment and seek further submissions

Following its analysis of the Undertaking and the submissions of interested parties, the Commission intends to publish the findings of its initial analysis and its draft decision within a reasonable period after submissions close. The Commission will invite further submissions on its draft decision for a specified period, which will likely be considerably shorter than this initial period.

The Commission expects that these submissions will respond to the draft decision, and does not expect a party to raise any further issues that were not addressed in the party's submission made during Stage 1, as discussed above. Parties are advised that, due to the statutory-imposed timetable within which the Commission must make its decision, the period within which these 'responsive submissions' can be made will be comparatively brief.

Stage 3: Publish final assessment

Taking into account the submissions made by Vodafone and other interested parties, the Commission will form a view on whether to accept or reject the Undertaking, and publish the reasons for its decision.

The Commission will have a clearer idea of this timeframe once the period of this initial consultation has expired.

4.1 Time limit for final assessment

The Act imposes a time limit for the Commission's assessment of undertakings. While the Commission intends to make its decision as soon as is practicable to do so, the Commission must in any event make a decision within six months of lodgement of the undertaking with the Commission. If the Commission does not do so, it is deemed to have accepted the undertaking. The Commission may also extend the decision making period by an additional three months but must provide a written notice to the carrier or service provider which includes a statement explaining why the Commission has been unable to make a decision on the undertaking within the six-month period. In addition, if the Commission requests further information in relation to the undertaking, the time taken for the Commission to receive the information is excluded from the six-month period. Similarly, the consultation period specified by the Commission is excluded from this timeframe.[5]

[5] See the revised s. 152BU (5), (6) & (7).

Since 26 November 2004, the Commission has made the following information requests of Vodafone:

- 8 December 2004, provision of the model used by PricewaterhouseCoopers (PwC) in preparing its cost modelling report for Vodafone and all data inputs used by PwC in generating the model outputs;
- 24 December 2004, provision of the model generated by Frontier Economics in the preparation of its welfare modelling report, along with all data inputs used by Frontier in generating the model outputs;
- 13 January 2005, disaggregation of the revenue and cost information supplied to the Commission under the Regulatory Accounting Framework (RAF) for the 2002-03 financial year, to identify or isolate those disaggregated revenues and costs which relate solely to the provision of the wholesale 'GSM originating/terminating' service.

Vodafone has provided the Commission with the requested information in relation to the 8 December 2004 and the 24 December 2004 requests. Information in relation to the Commission's request of 13 February 2005 has not yet been provided to the Commission.

4.2 Confidentiality

In general, the Commission is of a view that all information and submissions it proposes to take into account in assessing the Undertaking should be publicly disclosed. This enables persons with an interest in the Undertaking to comment on matters affecting their interests and enables the Commission to test the veracity of the information. As noted above, parties are encouraged to restrict confidentiality claims to a minimum and to establish appropriate confidentiality regimes where necessary.

However, the Commission is aware of the need to protect certain parts of Vodafone's information where disclosure of such information may harm Vodafone's legitimate commercial interests. Therefore, in order to balance the possible harm from disclosure and the harm that interested persons may suffer if they are unable to comment on matters affecting their interests, the Commission considers that a more limited form of disclosure may be appropriate. For example, Vodafone may require that parties who wish to have access to confidential information sign confidentiality undertakings.

In this regard, the Commission believes that such confidentiality undertakings should enable the relevant party to view all information supplied by Vodafone to the Commission in these proceedings. Should Vodafone choose not to supply any confidential information to parties who wish to have access to it, the Commission may decide to give lesser weight to such information if it is not available to these parties and the veracity of it cannot be tested by the Commission to its satisfaction.

5. Summary of the Undertaking and key issues that submissions should address

This section outlines the conditions contained in the Undertaking submitted by Vodafone. It also outlines the key issues that the Commission considers that submissions should address. This includes discussion of the costs estimates that have been used by Vodafone as a basis for submitting the Undertaking.

5.1 The Undertaking

The Undertaking specifies certain terms and conditions on which Vodafone undertakes to supply the Mobile Terminating Access Service (MTAS) for voice calls on its 2G/2.5G mobile network.

In addition to the body of the Undertaking, there is an attachment (Attachment A to the Undertaking) which is titled 'Vodafone Agreement for the Provision of Mobile Terminating Access Service'.

Further, in support of the Undertaking, Vodafone has provided a submission to the Commission and three appendices to that submission. These documents are:

- Vodafone Submission to the Australian Competition and Consumer Commission on Access Undertaking for the Mobile Termination Access Service, 26 November 2004 (the Vodafone Submission);
- Appendix 1 — The Fully-Allocated Cost (FAC) of services on Vodafone Australia's GSM Network Report, prepared for Vodafone Australia by PricewaterhouseCoopers LLP, 24 November 2004 (the PwC Report);
- Appendix 2 — Weighted Average Cost of Capital Report, prepared by Vodafone Australia, 25 November 2004 (the WACC report); and
- Appendix 3 — Modelling welfare-maximising mobile termination rates report, prepared for Vodafone Australia by Frontier Economics Pty Ltd, December 2004 (the Frontier Report).

If accepted by the Commission, the Undertaking would apply for three years from the date of acceptance.

The terms and conditions of the Undertaking may be broadly divided into:

(a) Price-related terms and conditions;

(b) Fixed-to-mobile pass-through safeguard; and

(c) Non-price related terms and conditions.

5.1.1 Price related terms and conditions

The Undertaking includes what Vodafone terms a 'target Usage Charge' of 17.5 cents per minute (cpm) for the MTAS. Vodafone considers that this target Usage Charge

represents a close approximation of the forward-looking efficient economic costs of supplying the MTAS.

The Undertaking also includes a proposed adjustment path to reach this target Usage Charge by 1 January 2007. As Table 5.1 shows below, this adjustment path begins from the current market rate (around 21 cpm) and involves three equal decrements of approximately 1.17 cpm at the start of each relevant year.

Table 5.1 – Vodafone's proposed adjustment path for MTAS pricing

Period	Usage Charge
1 July 2004 – 31 December 2004	21.00 cpm
1 January 2005 – 31 December 2005	19.83 cpm
1 January 2006 – 31 December 2006	18.67 cpm
1 January 2007 – 30 June 2007	17.50 cpm

The Commission notes that following requests for further information by the Commission, Vodafone wrote to it on 7 February 2005 informing the Commission that it had discovered an unintentional omission in the data inputs to the PwC cost model.

Vodafone has informed the Commission that this change would result in a downward revision of PwC's calculation of the cost of supply of the MTAS on Vodafone's network. Vodafone has provided the following revision for 2005–2007:

Table 5.2 – Vodafones's revised Usage Charges for the MTAS

Period	Revised Usage Charge
1 July 2004 – 31 December 2004	21.00 cpm
1 January 2005 – 31 December 2005	19.38 cpm
1 January 2006 – 31 December 2006	17.77 cpm
1 January 2007 – 30 June 2007	16.15 cpm
Any subsequent Validity Periods	16.15 cpm

Vodafone has advised the Commission that at this stage it does not propose to formally revise the cost modelling figures for the purposes of the Commission's consideration of Vodafone's undertaking.

Similarly, Vodafone has advised the Commission that it does not propose to revise the target Usage Charge set out in the Undertaking itself.

The Commission seeks the views of interested parties as to the reasonableness of the proposed target Usage Charge as an estimate of the efficient forward-looking costs of providing MTAS. (Parties should comment on the (original) target Usage Charge and the revised Usage Charges).

The Commission seeks the views of interested parties as to the reasonableness of the proposed adjustment path for Vodafone's MTAS prices.

5.1.2 Fixed-to-mobile pass-through safeguard

The Undertaking also includes a proposed fixed-to-mobile (FTM) pass-through safeguard (the FTM safeguard). The FTM safeguard requires that, as a pre-condition to an access seeker receiving Vodafone's proposed lower prices for the MTAS, an access seeker must reduce the prices they charge end-users for FTM calls.

The proposed FTM safeguard would operate by setting an adjustment path from the current FTM retail price in the market (of approximately 38.5 cpm) to a target FTM retail price of 22.5 cpm, over a three-year period linked with the adjustment path for the reduction in Vodafone's wholesale MTAS prices. The FTM adjustment path would involve three annual decrements of 5.33 cpm.

Vodafone's proposed wholesale MTAS and retail FTM rates are set out in diagram 5.1 below.

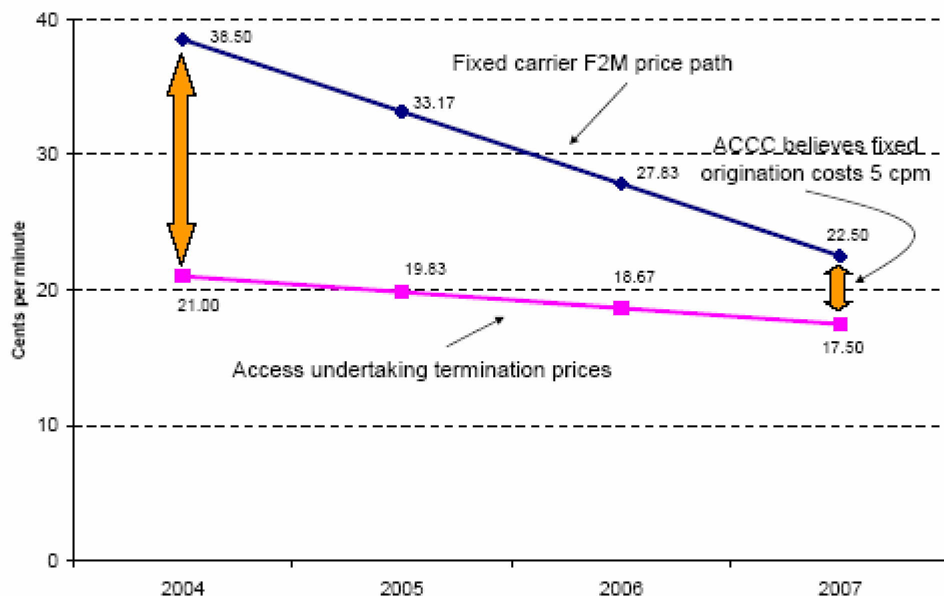

Diagram 5.1 Vodafone's proposed MTAS charges with corresponding FTM mobile rate requirements

Source: Vodafone submission in support of the Undertaking

The Commission seeks interested parties' views on a number of issues that relate to the FTM safeguard proposed in the Undertaking. These are listed below.

The Commission seeks the views of interested parties as to whether a 'pass-through' mechanism that links reductions in Vodafone's wholesale MTAS access price with price reductions in retail FTM prices is reasonable.

The Commission seeks the views of interested parties as to whether the FTM safeguard proposed by Vodafone is consistent with the standard access obligations in relation to the provision of the MTAS?

In the view of interested parties, what would be the likely effect of the implementation of the FTM safeguard as set out in the Undertaking?

Are the retail FTM price levels, set out in the proposed FTM adjustment path, considered reasonable by interested parties?

5.1.3 Non-price terms and conditions

Attachment A to the Undertaking contains a number of non-price terms and conditions, including provisions relating to the following:

- dispute settlement;
- termination and suspension;
- quality of service;
- credit management;
- network protection;
- safety;
- amendments to service and network;
- intellectual property ;
- confidentiality; and
- liability and indemnity.

This document can be accessed on the Commission's website at: http://www.accc.gov.au/content/index.phtml/itemId/551925

All terms not specified in the Undertaking

Clause 3(b)(i) of the Undertaking provides that the Undertaking does not specify all the terms and conditions on which Vodafone will comply with its SAOs. Accordingly, additional terms and conditions must be negotiated and agreed between Vodafone and an access seeker or, failing agreement, determined in accordance with ss. 152CP or 152CPA of the Act.

The Commission invites interested parties to comment on the reasonableness of any of the non-price related terms and conditions associated with the Undertaking.

The Commission also seeks the views of interested parties as to the reasonableness of Vodafone's decision not to specify in the Undertaking all the terms and conditions on which it will comply with its SAOs.

5.2 Submissions in support of the Undertaking

5.2.1 Cost Estimation

The Undertaking is supported by the PwC Report, and the underlying model produced in preparing this Report (the PwC model). The PwC model estimated that the forward-looking efficient economic costs of supplying the MTAS on Vodafone's network is 17.5 cpm.

The proposed target Usage Charge of 17.5 cpm in the Undertaking was therefore based on the outputs of the PwC model.

The Commission notes the advice from Vodafone of 7 February 2005 (referred to above in section 5.1.1) that it has discovered an unintentional omission in the data inputs to the PwC cost model. Vodafone has indicated that call minutes associated with international, roaming and voicemail were inadvertently excluded from total traffic volumes. Vodafone has advised the Commission that PwC has re-run the model with these call minutes, resulting in a model output of the estimated forward-looking efficient economic costs of supply of the MTAS on Vodafone's network of 16.15 cpm.

The Commission notes, however, that Vodafone has advised the Commission that it does not propose to formally revise the cost modelling figures for the purposes of the Commission's consideration of Vodafone's undertaking. Despite the position of Vodafone regarding the formal revision of the PwC model, the Commission considers it important that interested parties are aware of these changes to the PwC model, in order to facilitate their effective assessment of the Undertaking (and the material provided in support of the Undertaking) and their ability to comment on these matters.

The PwC modelling approach is broadly summarised in the next section.

Overview

- The PwC model is a top-down fully-allocated cost model. In sourcing model inputs, PwC used accounting and operational data supplied to it by Vodafone that relate to its GSM network for the financial year ended 31 March 2003. These data were not audited and are a mixture of 'historical' and 'forward-looking' costs as well as traffic volume data.
- The model allocates all relevant network and non-network costs between six services (incoming calls, outgoing calls, on-net calls, SMS messages, GPRS megabytes and the subscription 'service' or 'event').

- Costs, in the first instance, have been allocated directly to the six services listed above. The network costs have been allocated using 'routing factors'.[6] These routing factors were provided to PwC by Vodafone and estimate the extent to which different services use Vodafone's network more intensively than others.
- The network costs are forward-looking to the extent that 'network assets' have been revalued to reflect their 'current cost'. A 'tilted annuity formula' was applied to these network assets to calculate an annualised depreciation charge for these assets.
- The use of the titled annuity formula required both an estimation of the current cost of network assets and the expected forward-looking annual input price change of those assets. It also relies on an estimate of the 'cost of capital' which forms a direct input into the tilted annuity formula. Vodafone estimated a 'Weighted Average Cost of Capital' (WACC) of c-i-c per cent.
- The PwC model estimates the magnitude of 'fixed common costs' (FCCs). This estimate accounts for both network related and non-network related FCCs.
- Indirect costs have been allocated in proportion to the directly allocated costs.
- Total costs include a mark-up on all asset values to account for 'working capital costs'.
- A per unit cost estimate for MTAS is then estimated by dividing the total costs allocated to 'incoming calls' by the associated traffic volumes.
- To ensure that the 'per-unit' estimates are consistent, SMS and GPRS volumes were converted to 'call minutes' using a conversion equation.

Aspects of the cost modelling referred to above are outlined below in more detail. Interested parties are encouraged to respond to the issues raised by the Commission, or any other issues interested parties consider relevant.

Modelling approach

Choice of operator

PwC was engaged by Vodafone to estimate Vodafone's 'forward-looking efficient economic costs' of supplying the MTAS in Australia. The proposed target Usage Charge of 17.5 cpm contained in the Undertaking is based on the top-down fully-allocated cost model developed by PwC.

The 'top-down' modelling approach is in contrast to a 'bottom-up' approach, which would attempt to model the costs that would be incurred by an efficient hypothetical operator.[7] It is also in contrast to a modelling approach that attempts to scale up data

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6 Direct costs allocated to 'Subscription' were not based on 'route factored' volumes since they are not considered 'network conveyance costs' in the PwC model.

7 A 'bottom-up' cost model is one constructed on the basis of the engineering requirements for a network with given service and coverage specifications. Having determined the equipment and other inputs necessary to produce the required outputs, these inputs are then costed at prevailing prices, including the cost of capital appropriate to the business. The bottom-up approach contrasts with a 'top-down' cost model based on the accounting costs, outputs and coverage of an existing

associated with a single mobile network operator to replicate/approximate cost and usage levels for the entire mobile market.

Vodafone acknowledges that the first best approach is likely to be a TSLRIC+ model calculated on a 'bottom-up' basis and then reconciled with top-down accounting data to ensure the hypothetical assumptions are realistic. However, Vodafone notes that this approach was not undertaken due to time and data constraints.

The PwC model is based on the assumption that the Vodafone's network architecture and operating expenditure is 'efficient'.

The Commission invites interested parties to comment on whether the modelling approach employed by PwC is appropriate for estimating the forward-looking efficient economic costs of providing the MTAS on Vodafone's network?

The Commission seeks the views of interested parties as to whether the PwC model's assumption that 'Vodafone's network represents that of an efficient operator' is reasonable and the reasons for these views.

The Commission seeks the views of interested parties as to whether the PwC modelling approach of using cost inputs for Vodafone is appropriate, or whether an alternative approach, such as the use of an industry average or a 'hypothetical operator' is more appropriate.

In the event that an alternative modelling approach was undertaken, do interested parties believe this would change the estimate of the forward-looking efficient economic costs of providing the MTAS?

Choice of model inputs

The PwC model employs a mixture of accounting and operational data for Vodafone's GSM network for the financial year ending 31 March 2003, comprising inputs from the general ledger, fixed asset register and call data recording systems. Other inputs, including asset prices and routing factors, were sourced directly from Vodafone.

The PwC model inputs are a mixture of historical costs, forward-looking and actual traffic volumes. For example, Vodafone has revalued a number of its network assets on the basis of their 'current cost'. This revaluation is based upon the actual deployment of Vodafone's network in terms of existing equipment quantities. In contrast, the PwC model employs the 'historical' operating costs for Vodafone in 2002-03, sourced directly from Vodafone's general ledger. Further, the traffic volumes are stated to be actual volumes for Vodafone for 2002-03.

The PwC Report notes that such an approach, 'where the outputs from an optimised model are reconciled to actual operational data', is consistent with the approaches being adopted by other regulatory bodies (for example, the PTS in Sweden) in

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mobile carrier. A bottom-up cost model has been used to estimate TSLRIC+ for the purposes of the Commission's PSTN pricing since 1998.

arriving at estimates of the efficient costs of service provision.

In addition, the PwC Report notes that the granularity of Vodafone's cost data is such that it considered further disaggregation necessary. In calculating this further disaggregation of cost data, the PwC Report noted that it relied on its experience in other jurisdictions (specifically, information from costing modelling undertaken for Vodafone in the UK) and estimates provided by Vodafone.[8]

As noted elsewhere in this discussion paper, Vodafone wrote to the Commission on 7 February 2005, advising it that Vodafone had inadvertently excluded three categories of input data for the PwC model. As outlined above, Vodafone has indicated that call minutes associate with international, roaming and voicemail, were inadvertently excluded from total traffic volumes. Vodafone has advised the Commission that PwC has re-run the model with these call minutes.

The Commission seeks the views of interested parties as to whether the underlying input data used in the PwC model is appropriate.

Is the use of 2002-03 data appropriate given that the Undertaking was submitted on 26 November 2004?

Is the PwC model's use of 2002-03 as a base year appropriate given the proposed Undertaking and the period of time for which it will operate (if the Commission were to accept the Undertaking)?

Is the modelling approach of reconciling 'optimised' cost inputs with actual operating costs and actual traffic volume a reasonable/appropriate approach for estimating the forward-looking efficient economic costs of supplying the MTAS in Australia?

In the view of interested parties, should the model input data have been audited prior to being included in the PwC model?

Is the 'number of minutes' usage measure the most appropriate measure to estimate the cost of providing MTAS?

In the view of interested parties, is it appropriate for the PwC to further disaggregate Vodafone cost data using information from its cost modelling in the UK, and estimates provided by Vodafone?

Depreciation costs

Depreciation costs for 2002-03 were calculated in the PwC model using two different methods, depending on the type of asset in question.

For network capital assets (and where estimates of 'replacement costs' and 'useful lives' were available) depreciation costs were calculated using a 'tilted annuity

8 These further disaggregations and the sources used in deriving these are outline on page 15 of the PwC Report.

formula'. For non-network capital assets, depreciation costs were calculated using the accounting-based straight line formula.

The main differences between these two methods for calculating deprecation costs are that the titled annuity formula:

- recognises that the output profile of an asset changes over the life of the asset, and therefore is designed to attribute relatively more depreciation cost in years where the asset generates relatively higher output;
- requires the estimation of the 'replacement cost' and the 'expected forward annual input price change' of a particular asset; and
- includes within the formula, the 'required return on the capital employed' – estimated by Vodafone with a WACC calculation. In contrast, under the accounting-based depreciation method, calculation of a 'return on assets' (i.e. such as the WACC) must be added separately.

Vodafone notes that application of the tilted annuity formula is likely to underestimate capital costs compared to 'cash-flow based' economic depreciation. Vodafone also submitted that a number of cost allocation assumptions (in particular customer care costs) contained within the PwC model are also likely to underestimate capital costs.

The Commission seeks the views of interested parties as to whether the approach undertaken to calculate depreciation costs in the PwC model is appropriate and/or reasonable? Why or why not?

Do interested parties agree with Vodafone's view that that the use of the 'tilted annuity formula' is likely to understate annual capital costs of Vodafone's GSM network? Why or why not?

Do interested parties agree with the view that a number of cost allocation assumptions in the PwC model are likely to underestimate capital costs? Please provide reasons.

In the view of interested parties, is it appropriate that two different methods for calculating depreciation have been used in the PwC model? Please provide reasons.

Routing factors

Direct costs for conveyance services (outgoing calls, incoming calls, on-net calls, SMS messages and GPRS megabytes) were allocated using routing factors.

Routing factors reflect the extent to which different services use the Vodafone network more intensively than others. Where a particular service has a relatively higher routing factor, a relatively higher proportion of costs will be allocated to that service by adjusting traffic volumes for that service (using the routing factor) and then allocating costs on the basis of 'route-factored volumes'.

The routing factors used in the PwC model are based on engineering measurements drawn from Vodafone's actual network as provided by Vodafone. Where the necessary network engineering data were not available, the figures were estimated by Vodafone's network engineers.

The PwC Report notes that some routing factors are universal – for example off-net calls will use one radio network per unit of output, whereas an on-net call will use two. On the other hand, the PwC Report notes that other routing factors – such as for backhaul transmission links – will reflect the network architecture in question.

The Commission invites comment from interested parties on what are the appropriate routing factors to attribute to different network elements for the purpose of estimating the forward-looking efficient economic cost of providing the MTAS.

What are interested parties' views on whether routing factors attributed to 'Backbone transmission links' will differ for different mobile network operators depending on their network architecture? How will they differ (if at all)?

What are interested parties' views on whether routing factors attributed to 'Backbone transmission links' will be different for the 'incoming' compared to the 'outgoing' service?

SMS and GPRS conversion equations

In order to enable the allocation of network costs between the different conveyance services, SMS messages and GPRS megabytes were converted to 'minute' equivalents.

The PwC report notes that this was achieved using the standard conversion calculation that has been used in costing models in other jurisdictions such as the UK, Sweden and Greece. These conversion equations are shown in Tables 5.3 and 5.4 below.

Table 5.3 – SMS to call minute conversion equation

SMS message – call minute equivalent	
Number of bytes per SMS	40
Voice channel rate for SMS messages (bit/s)	767
Seconds in a minute	60
Bits in a byte	8
SMS per call minute conversion factor	144

Table 5.4 – GPRS to call minute conversion equation

GPRS megabyte – call minute equivalent	80%
Proportion of GPRS traffic in downlink	12%
Additional IP overheads	0.00905%
Channel data rate (Mbit/s)	100%
Channel occupancy efficiency	50%
Allowance for packetisation	3.584
1 Mbyte of GPRS user data = Mbits of downlink IP demand	0.543
One minute of a channel can carry Mbits of IP data	0.152
GPRS megabyte per call minute conversion factor	0.152

Source: PwC Report

The interpretation of these tables above is that one minute of a voice call is equivalent to 144 SMS messages or 0.095 megabytes of GPRS data.

The Commission seeks the views of interested parties as to whether the conversion equation used for SMS messages is appropriate and/or consistent with international approaches?

The Commission seeks the views of interested parties as to whether the conversion equation used for GPRS megabytes is appropriate and/or consistent with international approaches?

The Commission invites comment from interested parties on whether the assumption of SMS being the stand alone service (as opposed to voice being the stand alone service) is appropriate?

Cost of capital – WACC

Vodafone has proposed a Weighted Average Cost of Capital of c-i-c per cent in the WACC Report. This estimated WACC forms a direct input into the tilted annuity formula described earlier in this chapter.

Vodafone notes that specific WACC parameter values have been developed from analysis for comparable Australian and overseas companies providing similar services to the MTAS.

Vodafone's approach to calculating the WACC in this context involves applying the post-tax nominal WACC formula developed by R.R. Officer (the 'Officer Formula').[9]

The pre-tax nominal WACC is used in determining the cost component return on capital, within the projected costs of the MTAS contained in the cost model.

9 Officer R. R., 'The Cost of Capital of a Company under an Imputation Tax System', *Accounting and Finance*, 34 (1), May 1994.

The Commission seeks interested parties' views on the appropriate WACC estimate to use when attempting to estimate the forward-looking efficient cost of providing the MTAS?

The Commission also seeks interested parties' views on the appropriate parameter values (for parameters that are typically included in a WACC calculation) that should be used when attempting to estimate the forward-looking efficient economic cost of supplying the MTAS.

Fixed and common costs

The PwC model includes an estimate by Vodafone of the magnitude of FCCs. These include both 'network' and 'non-network' related FCCs.

To estimate the network related FCCs, Vodafone has estimated the number of coverage-related cells (which are noted to be the majority of network FCCs) and multiplied this by the unit costs of the relevant equipment.

Also included in the total estimate of FCCs, are non-network costs relating to central overhead functions; such as the finance and human resource departments.

The Commission seeks the views of interested parties as to whether the methodology used in the PwC model to calculate network FCCs is appropriate?

The Commission seeks the views of interested parties as to whether the inclusion of non-network FCCs, as specified in the PwC Report, is appropriate for estimating the forward-looking efficient economic costs of providing the MTAS?

Working capital

According to the PwC report, while working capital information was available for the PwC modelling process, it was only available on an aggregate basis.

As a result, in the PwC model working capital is allocated proportionally to all fixed assets using the following approach. It is allocated based on an estimation that the amount of working capital is approximately c-i-c per cent of the value of net tangible assets. Therefore, all asset values were marked up by c-i-c per cent.

The PwC report notes that this methodology allows the capital charge, calculated as the mean capital employed multiplied by the cost of capital, to be applied to all assets present in the business, rather than just the fixed assets.

The Commission seeks the views of interested parties as to whether an adjustment/mark-up to account for working capital is appropriate when seeking to model the efficient costs of providing MTAS?

The Commission seeks the views of interested parties as to whether the methodology used in the PwC model to estimate and allocate working capital is appropriate.

5.2.2 Estimate of 'network externality effects' and Ramsey 'mark-ups'

As noted in section 5.1, Vodafone's submission in support of the Undertaking includes a Report prepared for Vodafone by Frontier Economics (the Frontier Report), which is based on the 'Frontier model'. The Frontier model estimates that the likely welfare-maximising prices for the supply of MTAS is between 24.0 and 33.6 cpm.

The Undertaking, however, does not use the outputs of the Frontier model as a direct input to the target Usage Charge set out in the Undertaking. Vodafone has indicated in communications with Commission staff that the extent of its reliance on the Frontier Report and model, as inputs to setting the target Usage Charge in the Undertaking, will not change over the course of the Commission's assessment of the Undertaking. However, as the Frontier Report was provided to the Commission as part of the Vodafone Submission, the Commission will critically assess the Frontier Report and model. On this basis, the Commission also seeks the views of interested parties on the Frontier Report and model.

The Frontier analysis suggests that the welfare-maximising charges for the MTAS will be different from the marginal cost of supply for two reasons.

- Firstly, the presence of 'high' FCCs in the provision of mobile services will mean that setting of prices equal to marginal costs will not allow the recovery of these FCC's. Under Ramsey pricing principles, this means that the incremental costs need to be 'marked-up' to ensure that FCCs are recovered.
- Second, the existence of network externalities in the consumption of mobile services will mean that one person's decision to purchase a service (e.g. mobile subscription) may affect another person's welfare, hence price signals may need to be adjusted if private decision making is to lead to the maximisation of social welfare.

The Frontier model adjusts/marks-up the incremental costs of supplying the MTAS to account for these 'Ramsey' and 'Externality' effects.

Other aspects of the modelling approach can be broadly summarised as follows:

- Frontier sourced a range of information on prices, costs, demand and own-price elasticities for three services – mobile subscription; mobile originated/outbound calls and FTM calls – from a range of sources (see section on 'model inputs').
- The Frontier model then estimates demand functions for each these three services, under the assumption that these three services have inter-related demand functions.
- The model then calculates a set of prices for each of these three services and the level of demand at the estimated prices that maximises social welfare for a given set of cost and relative price elasticity assumptions.
- The Frontier model then considers two scenarios: Scenario 1 where the estimate of FCCs includes all network and central function costs; and Scenario 2 where FCCs include all network costs and non-network indirect costs.

The results of the model – either in Scenario 1 or Scenario 2 – are show in the Table's

5.5 and 5.6 below for a given set of elasticity assumptions.

Table 5.5 – Scenario 1

Run	Total mark-up (cpm)	**MTAS(cpm)**
1	10.73	**23.19**
2	14.83	**27.29**
3	18.42	**30.86**

Table 5.6 – Scenario 2

Run	Total mark-up (cpm)	**MTR (cpm)**
1	13.08	**23.74**
2	18.39	**29.05**
3	22.84	**33.50**

Source: Frontier Report

As these tables indicate, the range of values for the welfare-maximising prices for the supply of the MTAS (24.0 – 33.6 cpm) is based on six different modelling scenarios using certain elasticity inputs (discussed below).

The Commission seeks the views of interested parties as to the reasonableness of Frontier's estimated range of the welfare-maximising level of MTAS charges for Vodafone.

Model inputs

Cost inputs

Cost inputs for the Frontier model were provided by Vodafone based on its own internal analysis carried out by PwC. However, the Frontier Report notes that the PwC LRIC (LRIC is similar cost concept to TSLRIC+ as applied by the Commission) and the FCC cost estimates it used, differ from the cost estimates presented in the PwC Report (Appendix 1 to the Undertaking).

Price inputs

The following price data were used in the Frontier model:

- Mobile subscriptions are prices at c-i-c on average. This is calculated from Vodafone data on subscription revenues divided by the number of subscribers. This compares with the Optus estimate of $145 per year; [10]
- Mobile outbound call prices are estimated to be c-i-c cpm based on Vodafone's Australian mobile revenues divided by the number of internally-sourced minutes;

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[10] Optus, *Optus Submission to the Australian Competition and Consumer Commission on Mobile Services,* (Submission 2, June 2003), p. 31.

and

- FTM call average prices are estimated at 38.5 cpm as used by the Commission in its final MTAS decision.[11]

Demand inputs

The Frontier model includes the following demand information:

- Mobile subscriptions annual demand of 14.789 million (subscriptions), based on the reported number of subscribers for all carriers in the third quarter of 2003;
- Mobile outbound calls of 15.472 million minutes based on information on average monthly minutes of use per user on each network from fourth quarter of 2002 to third quarter of 2003, grossed up for one month, multiplied by the number of subscribers per network and then halved to reflect that minutes of use measured both incoming and outgoing calls; and
- FTM calls of 6,037 million minutes a year based on the Commission's estimate.

The Commission seeks views of interested parties on whether the methodology used to calculate the various cost, price and demand inputs is appropriate.

The Commission seeks views of interested parties on whether the calculated input values for cost, price and demand are appropriate.

Externalities - Ramsey mark-ups

The Frontier Report notes that the presence of 'high' and fixed common costs (FCCs) in the provision of mobile origination and termination services, means that the setting of prices equal to marginal cost will not allow the recovery of these FCCs.

The Frontier Report makes reference to a paper by Ramsey.[12] The Frontier Report states that:

> In the last twenty or thirty years, it has been accepted among economists that the standard for economically efficient prices in a multi-product firm is given by the Ramsey rules – and not by the rule that is suggested by the first fundamental theorem of welfare economics, that price should be equal to marginal cost.[13]

Magnitude of fixed common costs

An estimate of Vodafone's fixed and common costs was provided to Frontier by Vodafone. This estimate was sourced from the PwC model which was developed for Vodafone in support of the Undertaking (discussed earlier in section 5.1.1).

At the request of Vodafone, the Frontier model scales up the estimate of FCC by the

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[11] ACCC, *Mobile Services Review – Mobile Terminating Access Service: Final Decision*, p. 153.

[12] Ramsey, F.P, (1927), 'A Contribution to the Theory of Taxation', *Economic Journal*, Vol. 37, p. 47-61.

[13] Frontier Report, *op. cit.*, p. 2.

number of major mobile carriers/networks – i.e. multiplying PwC's estimate of Vodafone's FCC by four. This is based on the presence of four major mobile networks operating in Australia – Telstra GSM, Telstra CDMA, Optus and Vodafone – and represents an 'industry-wide' estimate of FCCs.

The Frontier model then considers two scenarios:

- Scenario 1 – FCCs include all network and central function costs; and
- Scenario 2 – FCCs include all network costs and non-network indirect costs.

Scenario 1 represents a lower bound of the estimate of FCCs, while Scenario 2 provides an upper bound.

The Frontier Report notes that industry-wide estimates of FCCs are likely to be conservative figures because:

- Vodafone's advice is that network FCCs are driven by geographic coverage and Telstra has a greater geographic coverage than the other MNOs. This is especially so in the case of its CDMA network; and
- No allowance is made for Hutchison's FCC of supporting its networks.

Elasticities

To account for the extent to which the price of the MTAS should be 'marked-up' to recover these FCCs on the basis of Ramsey pricing principles, the Frontier analysis considered estimates of the own-price elasticities for three services – mobile subscription, mobile originated/outbound and FTM. These are shown in Table 5.7 below.

In addition, the Frontier analysis estimated 'volume' elasticities which measure the change in the number of calls (mobile originated and FTM) associated with a change in the number of mobile subscriptions. These elasticities are also shown in Table 5.7 below.

Table 5.7 – Own-price and volume elasticities used in Frontier model

Service/Effect	Estimated elasticity range/input
Mobile subscription	–0.6 to –0.3
Mobile originated/outbound	–0.6 to –0.3
FTM	–0.6 to –0.3
Change in the volume of FTM calls from a change in the number of subscribers	0.4
Change in the volume of mobile outbound calls from a change in the number of subscribers	0.9 (where 0.7 is private effect and 0.2 an externality effect)
Change in the volume of subscriptions from a change in the number of subscribers	0

Ramsey mark-ups

The Ramsey mark-ups calculated by the Frontier model, on the basis of given elasticities are shown below in Table's 5.8 and 5.9 (**in bold**).

Table 5.8 – Scenario 1

Run	Subscription elasticity	Mobile outbound elasticity	FTM elasticity	Externality mark-up	**Ramsey mark-up (cpm)**	Total mark-up (cpm)	MTR (cpm)
1	–0.3	–0.6	–0.6	4.35	**6.37**	10.73	23.19
2	–0.3	–0.3	–0.3	6.30	**8.53**	14.83	27.29
3	–0.6	–0.3	–0.3	8.04	**10.38**	18.42	30.86

Table 5.9 – Scenario 2

Run	Subscription elasticity	Mobile outbound elasticity	FTM elasticity	Externality mark-up	**Ramsey mark-up (cpm)**	Total mark-up (cpm)	MTR (cpm)
1	–0.3	–0.6	–0.6	4.18	**8.89**	13.08	23.74
2	–0.3	–0.3	–0.3	6.20	**12.19**	18.39	29.05
3	–0.6	–0.3	–0.3	8.26	**14.58**	22.84	33.50

Source: Frontier Report

The Commission seeks the views of interested parties on, specifically, which categories of costs should be covered by Ramsey mark-ups when applying a TSLRIC+ model to access pricing.

The Commission seeks information on where regulators in other jurisdictions have applied Ramsey principles in access pricing.

The Commission seeks the views of interested parties as to the appropriateness of the elasticities used in the Frontier model.

The Commission also seeks the views of interested parties as to whether the Ramsey mark-ups proposed by the Frontier model are reasonable.

The Commission seeks information on whether interested parties are aware of alternative estimates of own-price elasticities of demand and cross-elasticities of demand for key services in a Ramsey model.

Network externality mark-ups

The Frontier Report also proposes that the welfare-maximising cost of the MTAS should reflect network externalities – i.e. if one person's consumption of a service (e.g. mobile subscription) generates a positive externality (that is, a benefit to others that the subscriber cannot privately capture), the welfare-maximising price for the subscription service may be lower than it would be in the absence of such an externality.

The Frontier analysis identifies three possible externality effects in the market for mobile services:

- the change in the volume of FTM calls from a change in the number of subscribers;
- the change in the volume of mobile originated/outbound calls from a change in the number of mobile subscribers; and
- the change in the volume of mobile calls from the change in the number of subscribers (however, in the Frontier model this effect is not modelled).

In assessing the potential impact of the above externality effects on the appropriate mark-up that should be attributed to the MTAS, the Frontier Report uses the 'Rohlfs-Griffin (RG) factor'. The RG factor is defined as 'the ratio of the marginal social benefit to marginal private benefit of an additional subscriber on the mobile network'.[14]

Frontier used an RG factor of 1.5 in its modelling, which is noted as 'the mid-point of the range chosen by the UK Competition Commission and significantly lower than that found by Frontier Economics (UK) in the UK analysis'.

The Frontier Report notes that use of the RG Factor means that the volume elasticities attributed to the externality effects of new subscribers (0.2 for new mobile calls per subscriber and 0.4 for new FTM calls per subscriber) are adjusted downwards.

For the modelling where Frontier does not account for the externality effect, Frontier set the RG factor to 1. This implies that there is no external benefit above the private benefit from additional subscribers.

The externality mark-ups that have been calculated by the Frontier model are shown below in Tables 5.10 and 5.11 (**in bold**).

Table 5.10 – Scenario 1

Run	Subscription elasticity	Mobile outbound elasticity	FTM elasticity	**Externality mark-up**	Ramsey mark-up (cpm)	Total mark-up (cpm)	MTR (cpm)
1	–0.3	–0.6	–0.6	**4.35**	6.37	10.73	23.19
2	–0.3	–0.3	–0.3	**6.30**	8.53	14.83	27.29
3	–0.6	–0.3	–0.3	**8.04**	10.38	18.42	30.86

[14] Frontier Report, *op. cit.*, p. 13.

Table 5.11 – Scenario 2

Run	Subscription elasticity	Mobile outbound elasticity	FTM elasticity	**Externality mark-up**	Ramsey mark-up (cpm)	Total mark-up (cpm)	MTR (cpm)
1	–0.3	–0.6	–0.6	**4.18**	8.89	13.08	23.74
2	–0.3	–0.3	–0.3	**6.20**	12.19	18.39	29.05
3	–0.6	–0.3	–0.3	**8.26**	14.58	22.84	33.50

Source: Frontier Report

The Commission seeks comments from interested parties on the appropriateness of the efficient cost of providing the MTAS being supplemented with a surcharge to reflect the existence of network externalities.

The Commission seeks comments from interested parties on the appropriateness of the magnitude of the mark-ups on cost, suggested by the Frontier model, to reflect network externalities.

The Commission seeks the views of interested parties on the RG factor of 1.5 used in the Frontier model.

The Commission seeks the views of interested parties on whether there are other kinds of externalities (relating to fixed-line, mobile and other networks and calls) that may be relevant to the decision about the imposition of a network externality surcharge.

The Commission is interested in receiving views and evidence on the relationship between external value placed on new subscribers and the level of population penetration of mobile telecommunications. Can the Rohlfs-Griffin factor be regarded as a constant?

The Commission seeks views on the trade-off between possible efficiency costs from a surcharge on mobile termination and the possible efficiency gains from subsidising mobile subscription.

The Commission seeks views on ways of analysing the increase in welfare that may flow to fixed-line callers as a result of additional subscription to a mobile network.

6. Summary of Questions

In summary, this Discussion Paper seeks the views of interested parties in relation to the following aspects of the Undertaking, and the submissions in support of it lodged with the Commission by Vodafone:

6.1 The Undertaking

The Commission seeks the views of interested parties as to the reasonableness of the proposed target Usage Charge as an estimate of the efficient forward-looking costs of providing MTAS.

The Commission seeks the views of interested parties as to the reasonableness of the proposed adjustment path for Vodafone's MTAS prices.

The Commission seeks the views of interested parties as to whether a 'pass-through' mechanism that links reductions in Vodafone's wholesale MTAS access price with price reductions in retail FTM prices is reasonable.

The Commission seeks the views of interested parties as to whether the FTM safeguard proposed by Vodafone is consistent with the standard access obligations in relation to the provision of the MTAS?

In the view of interested parties, what would be the likely effect of the implementation of the FTM safeguard as set out in the Undertaking?

Are the retail FTM price levels, set out in the proposed FTM adjustment path, considered reasonable by interested parties?

The Commission invites interested parties to comment on the reasonableness of any of the non-price related terms and conditions associated with the Undertaking.

The Commission also seeks the views of interested parties as to the reasonableness of Vodafone's decision not to specify in the Undertaking all the terms and conditions on which it will comply with its SAOs.

6.2 Submissions in support of the Undertaking

6.2.1 Cost Estimates

Modelling Approach

Choice of operator

The Commission invites interested parties to comment on whether the modelling approach employed by PwC is appropriate for estimating the forward-looking efficient economic costs of providing the MTAS on Vodafone's network?

The Commission seeks the views of interested parties as to whether the PwC model's assumption that 'Vodafone's network represents that of an efficient operator' is reasonable and the reasons for these views.

The Commission seeks the views of interested parties as to whether the PwC modelling approach of using cost inputs for Vodafone is appropriate, or whether an alternative approach, such as the use of an industry average or a 'hypothetical operator' is more appropriate.

In the event that an alternative modelling approach was undertaken, do interested parties believe this would change the estimate of the forward-looking efficient economic costs of providing the MTAS?

Choice of model inputs

The Commission seeks the views of interested parties as to whether the underlying input data used in the PwC model is appropriate.

Is the use of 2002-03 data appropriate given that the Undertaking was submitted on 26 November 2004?

Is the PwC model's use of 2002-03 as a base year appropriate given the proposed Undertaking and the period of time for which it will operate (if the Commission were to accept the Undertaking)?

Is the modelling approach of reconciling 'optimised' cost inputs with actual operating costs and actual traffic volume a reasonable/appropriate approach for estimating the forward-looking efficient economic costs of supplying the MTAS in Australia?

In the view of interested parties, should the model input data have been audited prior to being included in the PwC model?

Is the 'number of minutes' usage measure the most appropriate measure to estimate the cost of providing MTAS?

In the view of interested parties, is it appropriate for the PwC to further disaggregate Vodafone cost data using information from its cost modelling in the UK, and estimates provided by Vodafone?

Depreciation costs

The Commission seeks the views of interested parties as to whether the approach undertaken to calculate depreciation costs in the PwC model is appropriate and/or reasonable? Why or why not?

Do interested parties agree with Vodafone's view that that the use of the 'tilted annuity formula' is likely to understate annual capital costs of Vodafone's GSM network? Why or why not?

Do interested parties agree with the view that a number of cost allocation assumptions in the PwC model are likely to underestimate capital costs? Please provide reasons.

In the view of interested parties, is it appropriate that two different methods for calculating depreciation have been used in the PwC model? Please provide reasons.

Routing Factors

The Commission invites comment from interested parties on what are the appropriate routing factors to attribute to different network elements for the purpose of estimating the forward-looking efficient economic cost of providing the MTAS.

What are interested parties' views on whether routing factors attributed to 'Backbone transmission links' will differ for different mobile network operators depending on their network architecture? How will they differ (if at all)?

What are interested parties' views on whether routing factors attributed to 'Backbone transmission links' will be different for the 'incoming' compared to the 'outgoing' service?

SMS and GPRS conversion equations

The Commission seeks the views of interested parties as to whether the conversion equation used for SMS messages is appropriate and/or consistent with international approaches?

The Commission seeks the views of interested parties as to whether the conversion equation used for GPRS megabytes is appropriate and/or consistent with international approaches?

The Commission invites comment from interested parties on whether the assumption of SMS being the stand alone service (as opposed to voice being the stand alone service) is appropriate?

Cost of capital – WACC

The Commission seeks interested parties' views on the appropriate WACC estimate to use when attempting to estimate the forward-looking efficient cost of providing the MTAS?

The Commission also seeks interested parties' views on the appropriate parameter values (for parameters that are typically included in a WACC calculation) that should be used when attempting to estimate the forward-looking efficient economic cost of supplying the MTAS.

Fixed and common costs

The Commission seeks the views of interested parties as to whether the methodology used in the PwC model to calculate network FCCs is appropriate?

The Commission seeks the views of interested parties as to whether the inclusion of non-network FCCs, as specified in the PwC report, is appropriate for estimating the forward-looking efficient economic costs of providing the MTAS?

Working capital

The Commission seeks the views of interested parties as to whether an adjustment/mark-up to account for working capital is appropriate when seeking to model the efficient costs of providing MTAS?

The Commission seeks the views of interested parties as to whether the methodology used in the PwC model to estimate and allocate working capital is appropriate.

6.2.2 Estimate of 'network externality effects' and Ramsey 'mark-ups'

The Commission seeks the views of interested parties as to the reasonableness of Frontier's estimated range of the welfare-maximising level of MTAS charges for Vodafone.

Model inputs

The Commission seeks views of interested parties on whether the methodology used to calculate the various cost, price and demand inputs is appropriate.

The Commission seeks views of interested parties on whether the calculated input values for cost, price and demand are appropriate.

Externalities – Ramsey mark-ups

The Commission seeks the views of interested parties on, specifically, which categories of costs should be covered by Ramsey mark-ups when applying a TSLRIC+ model to access pricing.

The Commission seeks information on where regulators in other jurisdictions have applied Ramsey principles in access pricing.

The Commission seeks the views of interested parties as to the appropriateness of the elasticities used in the Frontier model.

The Commission also seeks the views of interested parties as to whether the Ramsey mark-ups proposed by the Frontier model are reasonable.

The Commission seeks information on whether interested parties are aware of alternative estimates of own-price elasticities of demand and cross-elasticities of demand for key services in a Ramsey model.

Network externality mark-ups

The Commission seeks comments from interested parties on the appropriateness of the magnitude of the mark-ups on cost, suggested by the Frontier model, to reflect network externalities.

The Commission seeks the views of interested parties on the RG factor of 1.5 used in the Frontier model.

The Commission seeks the views of interested parties on whether there are other kinds of externalities (relating to fixed-line, mobile and other networks and calls) that

may be relevant to the decision about the imposition of a network externality surcharge.

The Commission is interested in receiving views and evidence on the relationship between external value placed on new subscribers and the level of population penetration of mobile telecommunications. Can the Rohlfs-Griffin factor be regarded as a constant?

The Commission seeks views on the trade-off between possible efficiency costs from a surcharge on mobile termination and the possible efficiency gains from subsidising mobile subscription.

The Commission seeks views on ways of analysing the increase in welfare that may flow to fixed-line callers as a result of additional subscription to a mobile network.