International approaches to market definition: relevance to the definition of the market in which the mobile termination service is supplied

Report prepared for Vodafone

2 September 2003

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1. Introduction

Vodafone has asked Frontier Economics to advise on aspects of international approaches to market definition most relevant to the definition of the market in which fixed-to-mobile termination services are supplied. Vodafone has sought this advice in the context of the Australian Competition & Consumer Commission's (ACCC's) *Mobile Service Review 2003*.

The market definition determines the parameters within which the competitive conditions in the relevant market can subsequently be analysed. Of course, competitive pressure can be applied by potential entrants; but the forms of competitive pressure exerted by incumbents may be of a form that is quite different from the forms of competitive pressure exerted by potential entrants.[1] So the definition of the market classifies competitors as either incumbents or as potential entrants, and this has important implications for the subsequent analysis of competition.

In considering the relevance of international approaches to defining the market in which the mobile termination service is supplied, it is important to note that courts and regulators in Australia and New Zealand have adopted a somewhat different approach to market definition from that adopted in anti-trust matters in the European Union (EU) and the United States (US).

In this paper we argue that, consistent with the general approach of the Australian courts and regulators, it is appropriate to define the market in which the mobile termination service is supplied as the market for mobile telephony services.

This paper is structured as follows:

- Section 1.1 outlines, by way of background, the definition of the mobile termination service applied by the ACCC;
- Section 2 briefly outlines the origins of economists' use of the term 'market' in industrial organisation economics, the basis of a formal approach to market definition, and three issues that will affect market definition in relation to the mobile termination service;
- Section 3 briefly reviews some of the relevant issues in the approaches to market definition adopted in the US, European Commission (EC), and by

[1] See William Brock, "Contestable Markets and the Theory of Industry Structure: A Review Article", *Journal of Political Economy*, vol 91 (1983) pp 1055-66.

2. Market definition issues

This section outlines:

- the origins of the term ‘market’ in industrial organisation literature;
- a formal approach to defining markets that has been developed in the literature and forms the basis of the approaches adopted in competition

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The use of the term 'market' to analyse competitive conditions originates from an acknowledgement that, to properly examine the process of competition at work, one must consider the behaviour of a wider set of parties than the industry in question. One must consider both the members of the industry (who sell the product) and those to whom they sell (the buyers), as well as buyers and sellers or other (substitute or complementary) products that may affect pricing and competition. The term market is used to draw a line around those sellers and buyers whose actions may affect competition and pricing decisions in relation to any product or set of products.

That is, the term market in the industrial organisation literature suggests that, for the purpose of analysing competitive conditions, a market should be analysed by reference to a number of factors, including product specific, geographic and timing issues associated with:

- demand side substitutes;
- supply side substitutes;
- other characteristics that exercise a strategic influence on the nature of competition and pricing in the market. In the case of the market in which the mobile termination service is supplied, these may include:
  - the presence of substantial fixed and common costs;
  - complementarities in demand and supply; and
  - the nature of competition.

In the sections below we outline a widely accepted formal approach to defining markets in a simple case of a given number of firms, with constant returns to scale, and then consider how introducing fixed and common costs and complementarities in demand requires adjustments to arrive at a sensible market definition that facilitates analysis of competitive conditions.

2.2. Market power and market definition in the simple case

In the simple case of a given number of firms, with constant returns to scale, there is a relatively established methodology for defining the boundaries of the relevant market for the purpose of competition analysis. This is based on an examination of market power, using the approach outlined below. [4]

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[4] This section is based significantly on the exposition in Jordi Gual (2002) "Market Definition in the Telecommunications Industry", paper prepared for the European Commission, pages 6-12.

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- $r_{ij} = \frac{dqi}{dqj}\frac{qj}{qi}$, captures the extent to which firms compete aggressively. Aggressive competition is reflected in a negative r_{ij}. If one firm reduces the quantity it supplies (which would tend to increase prices), other firms react by expanding output (which would tend to lower price).

The above equation states that optimal mark-up of price over marginal cost for any given product where several firms compete with slightly differentiated products, depends on the own price elasticity of demand for the firm's product, the cross price elasticities of demand for other products in the market, and the extent to which firms compete aggressively.

The above relationship can be used as the basis for defining markets in the simple case of marginal costs being equal to fully-allocated unit costs and each firm producing only one product. The process of market definition can start by considering whether a single firm can sustain a price mark-up of, say, 10 per cent, for any given product. If the price elasticities of demand are such that a single firm could not sustain a price mark-up of this amount, one must widen one's market by adding substitute products (and firms) to the set of products (and firms) under consideration. Using this approach the relevant market can be defined as the set of products, or firms, which can profitably sustain a price mark-up of say 10 per cent.

That is, the boundary of the market is drawn around the group of firms or products for which where there are no substitutes that will prevent those firms from profitably maintaining a 10 per cent price mark-up.

In the analysis of competitive effects of a merger the question may be: could the merged entity increase prices by an amount of, say, 10 per cent relative to the price that would be expected to prevail in the market without the merger? In the analysis of regulatory matters, the question relates more directly to the level of the price mark-up over cost that can be sustained.

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significance of fixed costs in the mobile telecommunications industry, it is accepted that such fixed costs exist.

If firms have substantial fixed and common costs, there may be complementarities in supply, or economies of scope. In some industries, complementarities in supply are such that firms will generally supply any single product as part of bundle of goods.[6] Complementarities in supply, or economies of scope, exist when the costs to a firm of supplying both products are less than the costs associated with supplying the products separately.

That is complements in supply: $C(x,y) < C(x) + C(y)$

In many cases, complementarities in supply will result in all the services being supplied within a firm. However, complementarities in supply do not necessarily lead to multi-product firms. Rather, they imply that an individual firm will gain by co-ordinating its production across products. This co-ordination can either be done across firms (by means of contract) or within a firm. The approach adopted by a firm will depend on the costs of producing all products within the firm relative to the costs of coordination through contracting.[7]

Many types of telecommunications services exhibit complementarities in supply. This causes products to be produced in conjunction. It is highly unlikely that a firm would offer to supply each of mobile call origination, access, and termination as separate services.

Where there are significant complementarities in supply it is more difficult to arrive at a sensible market definition using the above approach by making a simple quantitative adjustment to the level of the mark-up considered reasonable.

The optimal set of prices for firms with fixed and common costs will involve recovering more of the fixed and common costs through the prices for products with relatively lower price elasticities of demand.

It is difficult for an external party, such as a regulator, to approach the market definition exercise by assessing a firm's mark-up of prices over cost in the supply

[6] John Stuart Mill's classic example of complementarities in supply was wool and mutton produced by a sheep farmer.

[7] This point made in Teece, "Economies of Scope and the Scope of the Enterprise", *Journal of Economics Behaviour and Organisations* (1980) pages 223-247, and illustrated by reference to mixed farming. Teece noted that orchardists must have space between fruit trees to facilitate growth of the trees and the movement of machinery. Economies of scope are realised when sheep graze between the trees but these can be realised by the orchardist leasing the land to a sheep farmer. The economies of scope do not have as strong an implication for the organisational structure of the firm as was suggested in early literature on economise of scope and organisation structure.

of a single product. The regulator would be required to determine the efficient and competitive level of costs for that product, which requires the regulator to determine an efficient allocation of fixed and common costs to each product. This, in turn, requires estimates of own and cross-price demand elasticities for all products, as well as estimates of the level of fixed and common costs. Consequently, seeking to define the relevant market using the level of mark-up of prices over cost is likely to be more problematic when firms have substantial fixed and common costs.

2.4. Complementarities in demand

In some industries, complementarities demand are such that firms generally supply, or consumers purchase, any single product as part of a bundle of goods. A text-book example of complementarities in demand is left and right shoes.

Goods are said to be complements in demand when consumers' willingness to pay (WTP) to obtain the goods together is greater than the WTP to obtain each of the goods separately.

That is, complements in demand: WTP (x, y) > WTP (x) + WTP (y)

Complementarities of demand do not necessarily lead to multi-product firms. Rather, they imply that an individual firm will gain by co-ordinating its selling across products. This co-ordination can either be done across firms (by means of contract) or within a firm.

Strong complementarities in demand mean that products are purchased as part of a bundle or cluster of goods. If this is not recognised, and the market definition analysis starts from the narrowest possible product (or set of products), it is likely that it will lead to an excessively narrow market definition. This is for two reasons:

> The price elasticity of demand for each individual component of the product is likely to be lower than the price elasticity of demand for the cluster of products. A price increase for one product is less likely to result in a demand reduction if prices of the other complementary products are unchanged. This is likely to be because customers will consider the impact the price change has on the total price of the cluster of products. If the product in question is only a small component of the total cost of the service, the change in the price of the bundle of goods will be very small, and the corresponding decrease in demand may be negligible.
>
> If the market definition exercise commences by considering the price elasticity of a single product in the cluster of products (e.g. call termination), the price elasticity of demand will *increase* as we expand the set of products considered to include complementary products. In contrast, the price elasticity of demand *decreases* as substitutes are added to the set

of products under consideration. Consequently, starting from analysis of the mark-up of price over cost for a single product consumed as part of a bundle of complementary products, may lead to an inappropriately narrowly defined market.

As stated in Gual (2002):[8]

> …If complementary effects are important (as well as scope economies from the supply side), the standard approach to market definition will make sense only when applied to a system of services. Indeed, we can say that a bundle of goods will constitute a system if the goods are complements.
>
> If firms indeed produce jointly these services and consumers buy them as a system, the analysis of observed mark-ups can be a very misleading indicator of market power and as a consequence, lead to very poor decisions in terms of defining markets. Firms producing a collection of goods in the presence of fixed costs will optimally charge higher mark-ups in those services that face more inelastic demand. A high mark-up in an individual service need not reflect an overall high level of market power.

Where such complementarities exist it would be more appropriate to consider the ability of a firm (or firms) to maintain profitably a small but significant increase in price over the bundle of products, rather than in relation to any single product within that bundle. Considering the SSNIP test in relation to a single product may lead to an inappropriately narrow market definition that may not facilitate an understanding of the process of competition at work.

2.5. Nature of competition

The nature of competition in a particular market is also important in assessing the extent to which any observed mark-up for a particular service is an indicator of a narrower market. If markets are defined in order to assist in the analysis of competition, they should not be defined in ways that divert attention from where competition is most intense[9].

Consider, in particular, markets where firms compete for a future revenue stream for a service they will offer by ‘bidding’ ex-ante for the rights to this revenue stream. If competition for these rights is strong, firms may compete away any possible future excess profits from providing the service through the price they pay for acquiring the rights to the future revenue streams.

[8] Jordi Gual, “Market Definition in the Telecommunications Industry” Paper prepared for the European Commission, 2002, pages 35-36.

[9] This was the view of the Trade Practices Tribunal in *Re Queensland Independent Wholesales Limited*, Australian Trade Practices Reports, 40,915, at 41-338.

In the market for mobile telephony services mobile operators compete for mobile subscribers. If competition for mobile subscribers is strong mobile operators will not sustain excess profits from the termination revenues generated as a result of these subscribers. The mobile operators will compete away any excess profits in their bid to acquire the mobile subscribers (or equivalently, the 'rights' to the future mobile termination revenues). A market definition exercise that does not recognise this, could lead to a narrow market if it examined only the 'mark-up' of revenues over the costs of providing a termination service.[10]

Even if the market definition exercise resulted in a narrow market, the authorities would need to recognise in any further analysis of market power that, in markets such as this, market shares are a poor indicator of a firm's ability to make excess profits.

The situation is analogous to that of 'aftermarket' power in circumstances where competition in the primary market is intense. In the context of the Kodak case brought before the US Supreme Court in 1992[11] it was shown that, even if consumers purchasing a durable good such as a photocopier do not anticipate correctly aftermarket prices for servicing and supplies of consumables, it is still possible that consumers may be protected by competition in the market for installation of the durable good.[12] If competition in the primary market is intense, then any profits that manufacturers expect to make in aftermarkets will be competed away in the primary market.

[10] These arguments would be valid, even in the absence of any demand complementarities between mobile termination and other mobile telecommunications services.

[11] Eastman Kodak Co. v. Image Technical Services, Inc. et al, 112 S. Ct 2072 (1992).

[12] C. Shapriro (1995) "Aftermarket and Consumer Welfare: Making sense of Kodak", *Antitrust Law Journal*, Vol. 63.

3. Approaches to market definition adopted in the EU, UK, and US

This section reviews the approach to market definition:

outlined in the Federal Trade Commission (FTC) *Horizontal Merger Guidelines 1997* (referred to as the FTC Merger Guidelines in the remainder of this paper), and approaches adopted by the courts in situations where there are significant economies of scope;

outlined in the EC's *Notice on the definition of the relevant market for the purpose of community competition law 1997*, and the manner in which markets were defined in the EC's *Recommendation on Relevant Product and Service Markets within the electronic communications sector susceptible to ex ante regulation 2003* (referred to as the EC's Recommendation in the remainder of this paper); and

adopted by Oftel in its review of the mobile termination charges, and by the Competition Commission in its 2003 determination on mobile termination charges.

3.1. FTC Merger Guidelines

The FTC Merger Guidelines outline the analytical framework the FTC adopts in considering whether a merger is likely to result in a substantial lessening of competition.

Market definition is the starting point for this analysis. The FTC commences by seeking to "…define a market in which the firms could effectively exercise market power if they were able to coordinate their actions."[13] The FTC Merger Guidelines state:[14]

> Market Definition focuses solely on demand substitution factors – i.e., possible consumer responses. Supply substitution factors – i.e., possible production response – are considered elsewhere in the Guidelines in the identification of firms that participate in the relevant market and in the analysis of entry…. A market is defined as a product or group of products and a geographic area in which it is sold such that a hypothetical profit maximising firm, not subject to price regulation, that was the only present and future producer or seller of those products in that area could impose at lease a "small but significantly and nontransitory" increase in price…A relevant market is the group of products and geographic areas that is no bigger than necessary to satisfy this test.

[13] FTC *Horizontal Merger Guidelines 1997*, Section 1.1 Market Definition, Measurement and Concentration.

[14] Ibid, section 1.1.

The procedure for identification of the relevant market outlined in the FTC Merger Guidelines mirrors the procedure described in section 2.2.

As stated in the above quotation, supply side substitution possibilities are not explicitly considered as part of the market definition, but are taken into account in the subsequent analysis of the:

> firms that participate in the relevant market. These firms are taken to include those that are currently producing or selling in the relevant market, and other firms not currently producing or selling in the relevant market but which would be likely to commence these activities within a year and without incurring significant sunk costs; and
>
> potential for firms to enter the relevant market. The FTC does not seek to identify potential entrants, but rather considers the potential for entry in terms of barriers to entry and the form of entry that may occur. [15]

3.2. Approaches adopted in the presence of complementarities

An obvious example of an industry in which complementarities in supply (economies of scope) lead to producers offering multiple services is the hospital service industry. In the United States, the Federal Trade Commission and the courts have considered numerous hospital mergers in the last 15 years and most of these cases have utilised a product market definition of a 'cluster' of inpatient, acute care services. Some commentators are struck by the range of items that are listed on a hospital's schedule of charges: [16]

> Aggregating individual hospital inpatient services into one so-called 'cluster market' has been the generally chosen alternative to analysing these numerous markets. The unique provision of certain services by hospitals and complementarities in production and consumption are the standard rationales for defining an inpatient hospital services cluster market (Vita *et al*, 1991). If complementarities are strong enough to define a cluster market, a monopolist producer of the cluster could profitably raise price by 5% since it would be unattractive for consumers to source individual components of the cluster from multiple independent sellers.

Other authors have emphasized the range of medical conditions that are treated.[17] Casual observation would confirm that patients are rarely admitted for

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[15] Ibid, Section 3.1.

[16] M G Vita, J Langenfeld and L Miller (1991), "Economic Analysis in Health Care Antitrust", *The Journal of Contemporary Health Law and Policy*, vol 19, pp 423-446 at 183.

[17] See G A Melnick, J Zwanziger, A Bamezai and R Pattison (1992), "The Effects of Market Structure and Bargaining Position on Hospital Prices", *Journal of Health Economics*, vol 11 pp 217-233.

gynaecological surgery and at the same time as for orthopaedic surgery. So the services seem to be neither substitutes nor complements in demand.

This product market definition of acute inpatient care services has led to some agonising – both by the FTC (which has lost some cases when arguing for narrower product-market definitions) and by some academic commentators. On 26 March 2003, the Joint FTC/DOJ Hearings on Health Care and Competition Law and Policy devoted a session to the issue of "Defining Product Markets for Hospitals".

Much of the debate seems to be misplaced. For example, Sacher and Silvia argue that some important competitive analysis is lost if one confines one's attention only to the aggregate product offerings of the cluster: [18]

> The analysis indicated that the cluster approach masked considerable variability in the concentration statistics across the inpatient categories that make up the overall cluster in San Luis Obispo, although they were highly concentrated throughout. Further, the cluster masked some variability in the underlying patient flow statistics by service category in both markets, although this observation appears to have held much more strongly in Sacrament. This indicates that disaggregation can provide a fuller understanding of the potential competitive effects of a merger in a variety of market configurations.

These considerations highlight the trade-offs that are frequently encountered in the process of market definition. It may well be that one needs to peer inside markets to fully understand patterns of competition. That is, patterns of competition within a market can best be analysed by disaggregating by product or by region. The question is whether that implies that markets should also be disaggregated. The trade-off is this: in the US, a wider market seems to preclude consideration of patterns of competition that are concentrated within particular products or regions within the market, whereas a narrower market seems to preclude consideration of patterns of competition that embrace multiple products or multiple regions. The Australian approach in the presence of such trade-offs is discussed in 4.2.

3.3. EC approach to market definition

The EC guidelines[19] on defining the relevant product and geographic market for the purpose of enforcement of competition law outline a slightly broader approach to market definition than that described in the FTC Merger Guidelines.

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[18] Seth Sacher and Louis Silvia (1998), "Antitrust Issues in Defining the Product Market for Hospital Services", *International Journal of the Economics of Business,* vol 5, pp 181-202 at p 198.

[19] *Commission Notice on the definition of the relevant market for the purpose of community competition law,* European Commission 1997, (97/c 372/03).

The EC guidelines adopt a similar starting point to the FTC Merger Guidelines, noting the SSNIP test may be the staring point in the process of market definition:[20]

> The question to be answered is whether the parties' customers would switch to readily available substitutes or to suppliers located elsewhere in response to a hypothetical small (in the range of 5% to 10%) but permanent relative price increase in the products and areas being considered. If substitution were enough to make the price increase unprofitable because of the resulting loss of sales, additional substitutes and areas are included in the relevant market. This would be done until the set of products and geographical areas is such that small permanent increases in relative prices would be profitable.

However the EC guidelines also specifically state that[21]:

> Supply side substitution possibilities may also be taken into account when defining markets in those situations in which its effects are equivalent to those of demand substitution in terms of effectiveness and immediacy.

The approach to market definition in the EC guidelines suggests a broader approach that explicitly incorporates in the market definition the possibility for supply, as well as demand side substitution. This is somewhat in contrast to the FTC approach in which availability of supply side substitutes, is not considered relevant to the market definition, but is taken into account in the subsequent analysis of competitive conditions in the market defined as relevant.

For example, the EC recommendation on relevant markets allows for the market for national (retail) calls provided at a fixed location to be defined as including both local and long-distance calls.[22] The main argument used by the EC is supply-side substitution; a supplier of local calls would be expected to be significantly constrained in its pricing of local calls by suppliers of long-distance calls, when the barriers to switching from supplying long-distance to local calls are insignificant.[23]

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[20] Ibid, paragraph 17.

[21] Ibid, paragraph 20.

[22] The recommendation in fact uses the term "local and/or long-distance", allowing some flexibility for National Regulatory Authorities to adopt different market definitions if they consider it appropriate.

[23] The EC recommendation states: "In respect of outgoing telephone calls, end users do not perceive local and national calls… to be substitutes for each other. Therefore, it can be argued that these constitute separate retail markets. However, an increase in the price of calls in one of these categories by a hypothetical monopolist could induce service providers in one of the other categories to purchase the wholesale elements needed, provided that they are available, to supply the relevant services"

3.3.1. The EC Recommendation: Approach to market definition in relation to the mobile termination service

The EC Recommendation identifies markets in the electronic communications sector in which ex ante regulation may be warranted. In considering the recommendation, the Commission was required to define markets in accordance with the principles of competition law.[24]

The Explanatory Memorandum accompanying the Recommendation notes that this involves characterising markets over an appropriate time horizon, taking into account both demand side and supply side substitutability.[25]

> The main purpose of market definition is to identify in a systematic way the competitive constraints that the undertakings face. The objective is to identify those actual and potential competitors of the undertakings that are capable of constraining their behaviour and preventing them from behaving independently of an effective competitive pressure. The market definition arrived at can also depend on the prospective time horizon considered. It is important to recall that market definition for the purpose of the Recommendation is not an end in itself but is a means to assessing effective competition for the purpose of ex ante regulation.[26]

However in considering the definition of the market in which the mobile termination service is supplied, the EC starts by considering the mobile termination services, and then examines possibilities for demand and supply side substitution that could constrain the level of termination charges on any given network.

The EC concludes that that there are no supply or demand side substitution possibilities given that:[27]

> it is not possible technically for calls to a given location or end user to be terminated via a network other than the network to which the called party subscribes; and

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[24] EC's Recommendation on Relevant Product and Service Markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communication networks and services, 2003, page 3.

[25] Explanatory Memorandum, Commission Recommendation on Relevant Product and Service Markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communication networks and services, 2003, pages 7-8.

[27] Ibid, pages 19-20.

there is little demand substitution at either the wholesale or retail level.

Several National Regulatory Authorities (NRAs) within the EU are undertaking an analysis of mobile markets to decide whether to adopt the proposed EC market definition. It is expected that most EU countries will adopt the definition, but there are also some exceptions. In particular, the German NRA, RegTP, has indicated that it considers that consumers purchase a bundle of mobile services as a package, and that the market should be defined in terms of the bundle of services. In a presentation given in May 2003, RegTP notes:[28]

> Consumers buy a 'package' of mobile services and are aware of the value of availability, i.e. the costs of incoming calls, packages are substitutable as they are more or less homogeneous to customers, which indicates according to the concept of effective substitutability that the market can be considered as a national market for mobile services on the retail level.

RegTP also states its view that the retail market….[29]

> exerts indirectly constraints for termination rates on the wholesale level as operators have to be aware of losing customers and are thus limited in their pricing behaviour, also the [interconnection] service being homogeneous the fixed incumbent can exert pressure while negotiating the termination rates

RegTP has not yet made a determination in relation to the regulation of the mobile termination service.

The approach adopted by Oftel and the Competition Commission is discussed in more detail below

3.4. Market definition adopted by Oftel and the Competition Commission

In the UK, Oftel[30] and the Competition Commission (CC)[31] followed closely the methodology proposed by the EC. They examined the possibility of demand and supply side substitution, starting with the smallest set of products. That is, they started with the market for terminating a call on a particular number. Both Oftel

[28] Presentation by Annegret Groebel, "RegTP's approach to the regulation of the mobile market under the new regime", presented at Mobile Regulation and Competition Law Brussels – 16 July 2003.

[29] Ibid.

[30] Oftel, *Review of mobile wholesale voice call termination markets*, EU Market Review, 15 May 2003.

[31] Competition Commission, *Reports on the charges made by Vodafone, O2, Orange, T-Mobiles for terminating calls from fixed and mobile networks*, December 2002

and the CC concluded that, at present, mobile voice termination on each operator's network constitutes a separate market[32].

3.4.1. Demand side substitution

In order to assess the existence of demand side substitutes that could be included in the relevant market, Oftel and the CC examined the effect on mobile customers' behaviour of an increase in termination charges under the calling-party-pays principle. Both Oftel and the CC examined:

the calling party's expected reaction an increase in price, and the called party's expected reaction to the same price increase; and

the potential for consumers to substitute wholesale voice call termination on one network with termination on another network.

The authorities concluded that the behaviour of callers to mobile phones is unlikely to impose any constraint on the level of mobile phone call termination charges. Consumers' low level of awareness of the prices of calls to mobile networks, the limited availability of effective substitutes, and the mobile operators use of on-net prices to separate price sensitive consumers suggest that callers are unlikely to react to an increase in the price of the fixed-to-mobile calls.

In addition, Oftel and the CC found that the majority of mobile subscribers are unlikely to react to a price increase. The authorities considered that the presence of users who chose their mobile network also on the basis of the cost of incoming calls is not sufficient to constrain mobile termination charges.

On the wholesale demand-side substitution (i.e. the potential for substitution of wholesale voice call termination on a network with wholesale termination on a different network), the UK authorities concluded that this cannot provide a direct constraint on the level of termination charges since an operator wishing to offer calls to a customer of a specific network must purchase termination services from that network operator.

3.4.2. Supply side substitution

Oftel and the CC considered both retail and wholesale supply substitution possibilities in analysing the constraints on the pricing of termination calls imposed by the potential for suppliers of other products to provide termination on a particular network.

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[32] Voice call termination to 2G and 3G subscribers is considered in the same market if the operator has both types of networks in place.

The UK authorities concluded that for retail supply–side substitution to impose a constraint on the level of mobile voice termination charges, operators that do not currently provide calls to mobiles must be able to commence supplying these services to undermine prices set above the competitive level. To have such effect, the new operators must be able to supply a service that does not rely on the provision of termination services by the operator to which the called party subscribes. Oftel and the CC argue that, at present, there is no such option.

From the wholesale point of view, for supply-side substitution to be an effective constraint on mobile voice termination charges, other firms must be able to commence providing mobile termination services to a specific subscriber of another operator's network in response to an increase in termination charges. The UK authorities analysed the ability of:

operators other than the one to which the called party subscribes,

local area networks over short-range radio technologies or wireless local area networks; and

mobile virtual operators,

to exert competitive pressure on termination pricing decisions and concluded that they do not constrain operators' decisions regarding the pricing of wholesale termination charges.

4. Approaches to market definition adopted in Australia

Australian courts and regulators have tended to adopt relatively broad approaches to market definition. This section outlines:

- the approach to market definition described in the Australian Competition & Consumer Commission (ACCC) Merger Guidelines (1999), and the manner in which markets have been defined in significant legal and regulatory decisions in Australia;
- the approach adopted to date by the ACCC in relation to certain telecommunications services.

4.1. ACCC Merger Guidelines

The ACCC Merger Guidelines 1999 refer extensively to the decisions of the courts and the National Competition Tribunal (the Tribunal). Consequently, we describe the approach outlined in the ACCC Merger Guidelines at the same time as discussing key decisions of the courts and the Tribunal.

The ACCC Merger Guidelines state that the assessment of a substantial lessening of competition should start from the definition of the relevant market.[33] A market is considered to include the following four dimensions:

- product;
- geographic;
- functional; and
- time.

The ACCC Merger Guidelines start the process of market definition from a similar point to that outlined in the FTC Merger Guidelines. For example, they state that:[34]

> The process of market definition can be viewed as establishing n the8tart the3ng t areaket Tc -0.06 T

Both demand and supply side substitution possibilities are considered as part of the market definition exercise.

The ACCC Merger Guidelines also go on to outline a broad range of factors that may also need to be included in the definition of the market including, amongst others:

1. the underlying objective of defining a market in relation to any particular issue;

2. whether it is appropriate to consider a 'cluster' market comprising a bundle of related products;[35] and

3. vertical integration and whether, given the manner in which firms are structured and compete in the market, it is appropriate to consider wholesale and retail levels as distinct markets, or as part of the same market.[36]

There is a clear acknowledgement that the intention of the market definition is to facilitate analysis of the process of competition at work in the relevant case. For example, in the Full Federal Court decision in the *Trade Practices Commission v Australian Meat Holdings* stated:[37]

> … the process of identification of the relevant market must be carried out keeping in mind the object of doing so; in the instant case that is to determine whether the appellant was at the relevant time in a position to dominate the market, or was by the acquisition placed in such a position.
>
> The linking together the process of definition of the market and its object implies some flexibility in the former.

This is similar in some respects to the principles expressed in the EC Explanatory Memorandum outlined in section 3.3.1: "The main purpose of market definition is to identify in a systematic way the competitive constraints that the undertakings face."

The Tribunal has acknowledged complementarities in supply or demand in previous judgements and noted that these complementarities may change over time. In the *Queensland Independent Wholesalers* authorisation case, the

[35] Ibid, page 36.

[36] Ibid, page 38.

[37] Ibid page 31. Refers to *Trade Practices Commission v Australian Meat Holdings* (1998), at 50, 104

[38] Re Queensland Independent Wholesalers Limited (1995) *Australian Trade Practices Reports*, 41-438 at 40,936.

[39] Ibid.

In summary, the approach to market definition adopted by courts and regulators in Australia, starts from a similar point as the FTC Merger Guidelines. However, the courts have tended to adopt a relatively broader approach to market definition than has been the case in the US, and to some extent in the EC.

4.2. ACCC approach: market definition for the mobile termination service

In its 2001 determination on the pricing methodology for (GSM) the mobile termination service, the ACCC outlined its view, at that time, on the definition of the mobile services market and the market in which the mobile termination service is supplied.[40]

At that time, the ACCC adopted a relatively broad approach to market definition, that took into account the complementarities in the products involved in the provision of mobile services. The ACCC concluded:

> That this is a national market involving distinct wholesale and functional elements allowing for the supply of mobile telecommunications services to service providers and end users (the ‘mobile services market’)

5. Implications for market definition for the mobile termination service

As outlined in a previous report prepared by Frontier Economics for Vodafone in June 2003, *Market Definition Issues in the ACCC's Mobile Services Review*,[42] we consider that the market in which the mobile termination service is supplied is best defined as the market for mobile telephony services. This is a national market that, at present, includes the following services:

- mobile access (including access to a handset, connection to a network, and usage of that network);
- outgoing call services to other networks (including on-net and off-net calls to mobile networks and fixed line PSTN networks);
- mobile termination services; and
- mobile originating services.

The complementarities in supply between the mobile access, mobile outgoing services, mobile origination and mobile termination services are such that the industry will consist largely of mobile operators supplying all these services. In terms of the definition of complementarity in supply, or economies of scope outlined in section 2.4, the cost of supplying all the above services together within a firm (or conceivably, by contracting between firms) will be less than supplying each of these services separately.

As noted, in the ACCC Discussion Paper, *Mobile Service Review 2003*, in 2001/02, carrier service providers accounted for approximately 10 per cent of the services billed. This suggests that some proportion of the market may be supplied by firms that contract with competitors or complementors to supply the bundle of services. Contractual arrangements of this kind are not inconsistent with arguing that mobile telephony services being best characterised as a bundle of services.

Given the complementarities in supply, mobile network carriers will be engaged in supplying all of the above services. They would be expected to set prices for each service in the bundle of services, having regard to the broader competitive environment in the mobile industry.

Complementarities in demand are also relevant. Customers will place a higher value on a bundle of services that embraces all mobile telephony services than they would on two separate services, one of which enables the customer to receive calls, while the other enables the customer to make outgoing calls.

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[42] Provided to the ACCC by Vodafone in July 2003

Stated in terms of the definition of goods which are complements in demand outlined in 2.4, a consumer's willingness to pay for a mobile service that includes termination of fixed-to-mobile calls would be greater than the sum of their willingness to pay for a service that only provides outgoing calls and their willingness to pay for a service that only provides incoming calls.

This (standard) definition of complementarity in demand implies that such complementarities in demand for the bundle of services that together comprises mobile telephony services exist whether the calling party or the receiving party pays for the fixed-to-mobile service. The implications of the calling-party-pays system is discussed in section 5.1

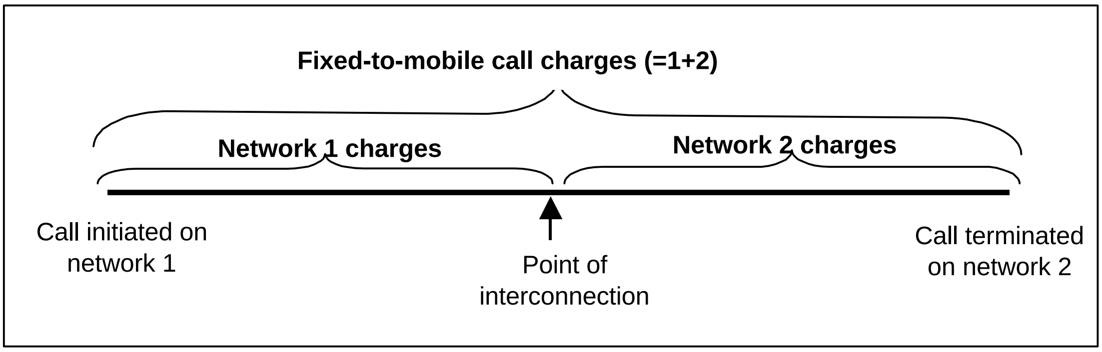
Recognising the complementarities in supply and demand, and the nature of competition for mobile subscribers, and defining the market in which the mobile termination service is supplied as the market for mobile telephony services, is consistent with the approach adopted by Australian courts and regulators.

5.1. Identity of the final purchaser(s) of mobile termination

In defining the market in which the mobile termination service is supplied, it is useful to consider whether the identity of the party that pays for the fixed-to-mobile termination would be expected to affect the market definition. More specifically, the issue is whether operating in a calling–party-pays (CPP) world rather than a receiving-party-pays (RPP) environment could affect the market definition.

The components of a fixed-to-mobile call are outlined, in simple terms, in Figure 1. The total charge for the fixed-to- mobile call is the sum of the charges levied by the network on which the call is initiated (network 1), and the network on which the call is terminated (network 2). In a CPP world the 'subscriber' of network 1 pays the total charge (1+2), and in a RPP the subscriber of network 2 pays the total cost (1+2). (A third possibility would be for each subscriber to meet the section of the charge that accrued to the network to which s/he was a subscriber.)

Figure 1



The amount of components 1 and 2 would be expected to differ depending on whether we are operating under CPP or RPP because of the different price elasticities of demand faced by networks 1 and 2. Imagine that each network was free to set the charge it collects without any negotiation with the party that pays the charge. Then, under RPP, network 1would be expected to set a higher charge for component 1, than under CPP because the relevant own and cross-price elasticities would be likely to be lower under RPP. Conversely, under RPP, network 2 would be expected set a lower price for component 2 than under CPP. Operating under a CPP or RPP may change the expected behaviour of networks 1 and 2 with respect to their customers. It is even possibly that it may change the total price of a fixed-to-mobile call, although this is far from clear.

However, operating under CPP or RPP does not alter the appropriate market definition. This is determined by the complementarities in supply and demand and does not depend on who bears the incidence of the costs associated with the fixed-to-mobile calls. Complementarities in demand exist because the mobile phone subscriber values the termination service being included as part of this bundle of services. The fact that under CPP the mobile phone subscriber does not bear the costs of the calls received does not negate the fact that this service is valued by the subscriber and is correctly described as a service supplied to the provider as part of a bundle of other mobile services.

The market should be defined in a manner that enables consideration of the broader process of competition at work in market for mobile telecommunications. Where appropriate, issues associated with the competitive conditions in any specific part of the market should be the subject of further attention.

It is worth noting that, if the SSNIP test is (inappropriately) applied to the termination charge rather than the bundle of goods, this methodology may lead to a narrower market definition in a CPP world than in a RPP world. In a RPP world the mobile subscriber would pay for (at least part of) the calls s/he receives. If one applied the SSNIP test to a single product within the bundle of products (e.g. to the fixed-to-mobile termination service), and did not take into account the complementarity arguments described above, it is possible that the SSNIP test would suggest that the mobile operator is constrained from increasing the mark-up of price over cost. A small increase in the price of receiving calls, if paid by the subscribing mobile customer, may result in more customers switching away from that mobile operator. That is, the higher elasticity of demand with respect to an increase in the mobile termination charge in a RPP world may lead to a broader market definition than would result if this approach to market definition in a CPP world.

Under CPP, therefore, it is important for the regulatory authority to recognise at the outset that the different services form a bundle or services, and the SSNIP test is appropriately applied to the bundle rather than to any individual product within that bundle. Otherwise as illustrated by the approach adopted by Oftel and the CC in the UK, in a CPP world it would be possible to conclude that the market is best defined in very narrow terms – i.e. that mobile voice termination on each operator's network constitutes a separate market.

In summary, given the complementarities in supply and demand, we consider that the appropriate market definition is not affected by whether the mobile operator is in a CPP or a RPP world. It may, however, affect the analysis of the competitive processes within the market defined as relevant.

6. Conclusions

Vodafone asked Frontier Economics to advise on aspects of international approaches to market definition most relevant to the definition of the market in which fixed-to-mobile termination services are supplied.

A key issue in the market definition exercise is the approach adopted by the courts and regulators in different in the presence of complementarities in supply or demand.

We consider that, in the case of mobile telephony services, complementarities in supply and demand are such that the market definition exercise should commence by considering the bundle of services that together comprise a mobile telephony service rather than by considering issues associated with the supply of any single service within that bundle.

Furthermore, we consider that it is consistent with the general approach of the Australian courts and regulators to recognise these complementarities in supply and demand, and define the market in which the mobile termination service is supplied as the market for mobile telephony services.