Setting the price for mobile termination services closer to cost

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1. A PRICE CLOSER TO COST

In March 2004, the Australian Competition and Consumer Commission (the Commission) issued its Draft Decision on the *Mobile Terminating Access Service* (the Draft Decision). This Draft Decision proposed that there should be a 'closer association between the price and underlying cost of the mobile termination service'.[1]

Vodafone has asked Frontier Economics for advice on the meaning that the Draft Decision gives to its notion of the 'cost of the mobile termination service'. This Report has been written in response to that request.

The Report explains how cost is defined in the literature of economics. It explains that cost is a generic notion in economics. The genus incorporates many specific notions of cost. These specific meanings of cost are distinguished by three principle characteristics. Unless these characteristics are specified, the idea of cost is very general and can incorporate a large range of types and (it follows) a large range of dollar values. It is not possible to discern from the reasoning of the Draft Decision which specific notion of cost the Commission has in mind.

2. THE MEANING OF OPPORTUNITY COST

2.1 All costs are opportunity costs

Almost every first-year undergraduate economics subject introduces students to the generic notion of costs and to particular specific definitions of particular types of cost. The generic notion of cost is that of opportunities forgone. Indeed, students are commonly told that all costs are opportunity costs.

Perhaps the best-known definition of economics is that proposed by Lionel Robbins in his classic *The Nature and Significance of Economic Science.*[2] Robbins defined economics as the study of how scarce resources are allocated to

[1] Draft Decision p 165.
[2] Lionel Robbins, *An Essay on the Nature and Significance of Economic Science,* Macmillan, 2nd edition, 1935.

best achieve particular ends; and, indeed, this definition embraces much of the activity of modern economists. Certainly, much of economics is concerned with analysing decisions that consumers, employers, employees, businesses and governments make to allocate scarce resources.

Because resources are scarce, any decision to allocate resources to one particular use is likely to mean that those resources are not available for other (competing) uses. That is, decision-makers face trade-offs. As a widely-used elementary economics textbook explains in its opening chapter: "The cost of something is what you give up to get it."[3] Because all costs in economics are opportunity costs, the authors offer a similar definition for opportunity cost: "The opportunity cost of an item is what you give up to get that item."[4]

All costs must be related to decisions. Gans, King and Mankiw utilise the example of a decision that suits their undergraduate readership: the decision to undertake an undergraduate degree at a university. The costs of that decision might commonly be thought to include such items as rent and food. But, the authors explain, these expenses are not costs if they would need to be incurred whether or not the student chooses to go to university. They are only costs associated with the decision to go to university if they are opportunities forgone as a result of that decision.

Suppose an undergraduate degree takes three years and the only other alternatives available to the prospective student are to take a job and receive an aggregate income of $100,000 over the three years or to indulge in leisure activities for the whole of the three years. The prospective student is now confronted with a problem that can be classified as an economic problem according to the definition of Lionel Robbins. There is a scarce resource (time) that has to be allocated in one of three ways: study, work or leisure.

The solution to the problem is found by the prospective student's ranking the three alternatives and choosing the highest-ranked option. Suppose the ranking is:

1. study;

[3] Joshua S Gans, Stephen P King and N Gregory Mankiw, *Principles of Microeconomics,* Harcourt Brace, 1999 edition, p 6.
[4] *Ibid,* p 6.

2. work; and

3. leisure.

If the student is a rational decision-maker, he/she will choose the highest-ranked alternative and study at university. The opportunity cost of the decision is the best alternative that is forgone as a result of that decision. In this case, the opportunity cost of the decision is the work or, expressed in terms of dollars, the $100,000 that would be earned if the work option were pursued.

2.2 Specifying the cost of a particular decision

In this example, the cost of the decision to go to university can only be determined because certain dimensions of the economic problem have been specified. These dimensions are needed to be specified before one could approach the question as to what was the cost of the decision. The principal dimensions of the decision that need to be specified before one can determine the cost of any decision are the following:

- **The decision variable.** In the example, the decision variable is the time that needs to be allocated.

- **The constraints on the decision maker.** In the example, the constraints are that there are only three alternatives from which one (and only one) must be chosen.

- **The persons or group of persons whose costs are to be considered.** In the example the costs are those borne by the decision maker; but this is not always the case. In some cases, the decision-maker may impose costs on other parties. These are called 'external costs' in economics.

In addition to these three obvious dimensions, other issues may arise before one can specify what is meant by the cost of any decision. In the example of Gans, King and Mankiw, an obvious dimension is the objective of the prospective student. If the prospective student had ranked leisure above work, the opportunity cost of studying would have been three years of leisure rather than the work.

Although this is a relevant dimension of the problem in the example, this dimension of the problem does not normally arise when we are analysing decisions of for-profit enterprises because the ranking is determined by the contribution that an option makes to the value of the enterprise.

In the following sections of this Report, we shall examine each of these three principal dimensions of an economic decision that determine the meaning of the cost of that decision. We show how the dimension can be specified when specifying the cost of the mobile termination service; and we examine the extent to which the Draft Decision specifies the dimension.

3. SPECIFYING THE MEANING OF THE COST OF THE MOBILE TERMINATION SERVICE

3.1 The decision variable

Although all costs in economics are opportunity costs, the nature of any economic decision must be specified before one can work out the cost of that decision. One of the three key dimensions of any economic decision is the decision variable. Until the decision variable is specified, one is unable to determine what will be forgone as a result of the decision.

The Draft Decision states that the Commission received submissions in favour of two quite-different types of costs:

> Throughout the course of this inquiry, many parties have advocated the replacement of the retail benchmarking pricing principle with a cost-based alternative. In this regard, two main cost models have been proposed – short-run marginal cost (SRMC) and total service long-run incremental cost (TSLRIC). The merits of each alternative are discussed in turn below.[5]

The word 'marginal' as in the phrase 'short-run marginal cost' tells an economist that the relevant decision variable is one extra unit of output. That is, any specific type of cost that is qualified with the word 'marginal' refers to what must be given up if one (and only one) extra unit of the product is produced. If the product

[5] Draft Decision, p 161.

in question is the mobile termination service, the marginal cost might be the cost of a decision to provide one extra termination service for one minute.[6]

The decision variable in any marginal cost is quite different from the decision variable in total service long-run incremental cost (TSLRIC). As the Draft Decision explains, the words 'total service' indicate that the decision variable is the entire service.[7] This means that TSLRIC will depend critically on how the 'total service' is defined.

Chapter 4 of the Draft Decision deals with the issue of how the service should be described. The discussion assumes that the service should be confined to terminating services of certain kinds: it does not include originating services. Furthermore, the Draft Decision confines the relevant services to voice services – whether the calls originate on fixed-line or mobile networks. So the decision variable of any TSLRIC notion of cost is a decision to add or remove the whole of the mobile termination service from the range of products of a mobile network operator.

3.2 The constraints

The second dimension of an economic decision that needs to be specified before a specific cost is identified is the set of constraints that confront the decision-maker. Elementary textbook presentations of costs generally distinguish between long-run notions of cost and short-run notions of cost. This is to distinguish different types of constraints that confront the decision-maker. A long-run decision is defined as one that is to take effect so far into the future that the decision maker is not constrained by its current stock of capital equipment. Whereas a short-run decision is one that relates to a period of time in the immediate future such that the current stock of capital equipment must be taken as given.

Any cost measure that is to be applied to a real world problem will need to be precise about the constraints on the decision-maker because unless one can specify what possibilities are open to the decision-maker, one cannot be sure what possibilities are being forgone as the result of any particular decision. If a cost is to be specified for any particular real-world problem, it is generally necessary to

[6] The time period of one minute is used in the Draft Report p 162.
[7] Draft Decision p 162.

specify constraints more-precisely than a reference to long-run or short-run. This can be seen quite readily by considering the cost notions discussed in the Draft Decision.

The Draft Decision mentions two alternative ways in which TSLRIC may be defined. The first definition of TSLRIC is:

> It is the incremental or additional cost – on an annual basis – the firm incurs in the long run in providing a particular service (or production element) as a whole, assuming the scale of all of its other production activities remain unchanged.[8]

If this definition were to be applied to the service that the Draft Decision has defined in the Draft Decision, this (first) definition would amount to what would be forgone if a firm that was offering its current range of services *except the mobile termination service* were to make a decision to add the mobile termination service to its range.

Because of the definition of the mobile termination service, this definition of TSLRIC of the service would mean that one would have to estimate the cost of providing all services (including all mobile origination services and data services) and to ask what extra cost would be incurred if a decision were made to add mobile termination services to this offering. That is, this definition would not include the costs of any capital equipment that was needed to support mobile origination services.

The second alternative definition of TSLRIC suggested by the Draft Decision is:

> it is the total cost (on an annual basis) the firm would avoid in the long run if it ceased to provide the service as a whole.[9]

One problem with this definition is that it does not specify the level of other services that the decision-maker would continue to supply. This may be particularly relevant if one were to attempt to apply this definition to estimating the TSLRIC of the mobile termination service. If a network operator were to

[8] Draft Decision p 163.
[9] Draft Decision p 163.

cease providing any mobile voice termination services, it is likely that the scale of its origination services would also decrease significantly. If the network were reconfigured (as is expected by the long-run descriptor) to accommodate this reduction in size, the estimate of TSLRIC would be much larger than it would be if one were to assume (somewhat artificially) that the decision would be made to cease offering termination services but to continue offering originating services at the same rate as before.

This is merely to illustrate that any measure of TSLRIC might be highly sensitive to the precise set of constraints that is specified. If one is to proceed to estimating the cost of any particular decision, the constraints that confront the decision-maker must be specified with a great deal of precision.

3.3 The person(s) whose costs are being considered

The final attribute of cost that must be specified before one can proceed to any estimation is the identification of the person or persons whose forgone alternatives are to be included. An obvious person to include is the person (or institution) that is making the resource-allocation decision. This may mean (as is commonly allowed for in the textbooks) that the costs differ among the enterprises in the relevant market.

The second issue to be considered is whether allowance is to be made for costs that a decision visits upon persons other than the decision maker. Common examples of such ('external') costs are pollution and congestion costs. These costs may not be considered by the decision maker; but they may be highly relevant for many decisions that regulators need to make.

4. THE APPROACH OF THE DRAFT DECISION

Frontier Economics has been asked for advice on the meaning that the Draft Decision gives to its notion of the 'cost of the mobile termination service'. We are unable to answer this question definitively. Nevertheless, certain propositions emerge from a careful reading of the Draft Decision.

4.1 SRMC is rejected

The Draft Decision is clear in rejecting short-run marginal cost as a basis for mobile termination prices. It does this because SRMC 'would take no account of the long-run costs a mobile operator incurs when it provides mobile termination services to access seekers.' This follows from the definition of SRMC.

As was noted in section 3.1 above, marginal cost refers to the cost of a decision to offer one extra termination. As was noted in section 3.2, short-run refers to the constraint that the decision to offer one extra termination is made with the current stock of capital equipment. The Draft Decision notes that this cost would be around 1 cent. It would make no contribution to the fixed or common costs or the mobile network operator because these would not be opportunities that would be forgone as the result to making the decision specified within the constraints that are specified.

4.2 TSLRIC is thought to have certain attractive properties but it is rejected

The Draft Decision seems to adopt an ambivalent attitude to TSLRIC measures. The Draft Decision rejects adopting a TSLRIC price on three grounds:

- it would be costly to estimate;
- it would be time-consuming to implement; and
- it would lead to such a reduction in prices that it would be likely to generate significant and potentially harmful disruption to a number of telecommunications carriers.[10]

The cost and delay points have some force. The experience of regulators in Europe and New Zealand is that the estimation of TSLRIC costs are particularly open to disputes as to what categories of costs should be counted and what should not. One sensible response of the regulator to these costs and delays would be to consider them as bearing on the decision whether or not the service should be subject to regulation. The more resources that are likely to be wasted through costs of estimation and delay, the less likely is regulation to promote economic efficiency.

[10] Draft Decision pp 164-5.

4.3 A target termination price is adopted but this price is not based on any precise notion of cost

The Draft Decision adopts a target termination price based on four pieces of information:

- estimates of TSRIC for some mobile termination services in some overseas jurisdictions;
- the Commission's own estimate of Telstra's TSRLIC – but the specification of this cost and the numbers are commercial in confidence;
- termination charges for MTM calls; and
- a range of other information.

It is impossible to see from the Draft Decision how, or in what way, these sources of data might be related to any specific notion of cost. There is a particular problem associated with the use of costs that relate to decisions that were made by persons other than the persons who are to be subject to regulation. The Draft Decision contains no evidence that the estimates from overseas jurisdictions represent reliable estimates of the opportunities that would be forgone by the making of similar decisions in Australia. Indeed, because the Draft Decision does not specify the nature of the decisions whose costs they wish to estimate, it cannot be clear that the estimates from overseas relate to decisions that are similar to those for which cost estimates are sought in Australia. Similarly, it is not clear how estimates of the opportunities forgone by a decision of Telstra to undertake mobile termination services could be extrapolated to infer the costs that would be borne by a similar decision of another Australian mobile network operator.

Any empirical estimate of cost must be based on a notion of cost that specifies the dimensions of the decision to which the cost relates. This requires (as a minimum) the precise specification of: (i) the decision variable that gives rise to the forgone opportunities; (ii) the constraints confronting the decision maker; and (iii) the person(s) whose forgone opportunities are to be considered.

These three dimensions of cost must be specified because cost estimates can be highly sensitive to changes in any of these three dimensions of cost.

5. CONCLUSIONS

All costs in economics are opportunity costs. This means that they are the opportunities forgone as the result of a particular decision. If a cost is to be estimated, the decision must be specified. This requires specification of: the decision variable, the constraints on the decision maker and the identity of the bearer of the costs must all be specified. The Draft Decision has argued for prices for the mobile termination service that better reflect costs but it has nowhere stated what specific notion of costs it has in mind. This can only be done by specifying the dimensions of the economic decision that the Commission has in mind.

It proposes a target termination price. This target price is based on assorted pieces of information – some of which relate to costs to some persons of some decisions relating to mobile termination. It is impossible to see from the Draft Decision how the target termination price is related to the cost of any particular type of decision.