ACCC Mobile Service Review: Effects of Declaration on Efficiency

A REPORT PREPARED FOR VODAFONE AUSTRALIA

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ACCC Mobile Service Review: Effects of Declaration on Efficiency

Contents

1 Introduction

Frontier Economics has been asked by Vodafone for its opinion on the efficiency analysis of declaration contained in the ACCC's Draft Decision on the *Mobile Terminating Access Service*[1] (the Draft Decision). The analysis of efficiency is contained principally in Chapter 7 of the Draft Decision. This is entitled "Will declaration encourage the economically efficient use of, and the economically efficient investment in, infrastructure?

Chapter 7 devotes most of its attention to the prices for the mobile termination service that would encourage the economically efficient use of infrastructure. (It does also discuss efficient investment in infrastructure.) The Chapter argues that efficient use of infrastructure is promoted if prices reflect the efficient costs of providing services. If one reads only Chapter 7 of the Draft Decision, one cannot discover what the Commission means by cost in this context. However, this becomes clear in Chapter 8 of the Draft Decision.

Chapter 8 makes it clear that the relevant notion of cost is total service long-run incremental cost (TSLRIC). Section 8.3 notes that a number of data sources suggest a TSLRIC of no more the 12 cents a minute; and this is the number that Draft Decision adopts. It proposes to implement a gradual reduction of the mobile termination rate from 21 cents per minute to 12 cents per minute by 1 January 2007.

This Report examines the reasoning of the Draft Decision – in particular, its reasoning that the efficient use of, and efficient investment in, infrastructure would be encouraged by reducing the price of the mobile termination service from its present level to a price based on TSLRIC. The Report deals with both types of efficiency. With respect to each, we explore what the literature of economics says about efficiency. The Report then examines the extent to which the reasoning of the Draft Decision is consistent with the literature of economics.

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[1] Australian Competition and Consumer Commission, Mobile Services Review, *Mobile Terminating Access Service,* Draft Decision, March 2004.

2 The encouragement of the economically efficient use of infrastructure

2.1 CRITERIA FOR ASSESSING ECONOMICALLY EFFICIENT USE OF INFRASTRUCTURE

As was noted in section 1 of this Report, Chapter 7 of the Draft Report consists largely of reporting the reasoning of the Draft Decision to the effect that the efficient use of infrastructure is encouraged by prices that reflect costs; and Chapter 8 of the Draft Report makes it clear that the costs referred to in Chapter 7 are TSLRIC.

The theory on which these propositions purport to be based was established in economics in the 1920s and 1930s. This theory is based on three propositions:

- in the absence of fixed costs, common costs and externalities, economically efficient use of infrastructure is encouraged by prices that equal marginal costs;

- the setting of prices at marginal costs may not be consistent with the recovery of total costs because of the presence of fixed and common costs; in this case, economic efficiency is encouraged by marking up prices above marginal costs in accordance with the Ramsey rules; and

- in addition to the adjustment of prices needed to allow for the recovery of fixed and common costs (the preceding point), prices may also need to be adjusted to account for external effects.

Part 2 of this Report is organised around these three propositions. It explains how and in what ways the Draft Decision takes account of each of these propositions.

2.2 IN THE ABSENCE OF FIXED COSTS, COMMON COSTS AND EXTERNALITIES, THE ECONOMICALLY EFFICIENT USE OF INFRASTRUCTURE IS ENCOURAGED BY PRICES THAT EQUAL MARGINAL COSTS

2.2.1 The basis of the rule that prices should be set at marginal costs

The economists' presumption in favour of prices being set at marginal cost ('the marginal cost rule') grew out of work by the late nineteenth and early twentieth-century Cambridge economists, Marshall and Pigou. Their contributions were sharpened by debates among writers of the 1930s (such as Dobb, Lange and

Lerner) who were exploring how the planning hierarchy of a socialist economy might best promote the economically efficient use of capital.[2]

Economics always defines costs in terms of opportunities that are forgone as a result of particular decisions. That is, one can only specify what is meant by a cost, if one is quite precise about what decision is being made.

The marginal cost rule is concerned with the decisions of producers as to the rate at which they should produce output from a given stock of infrastructure. The marginal cost is the value of opportunities that are forgone as the result of a decision to increase the rate of output by one unit.

The idea behind the rule that prices should equal marginal costs is that this will ensure that the decisions (as to their rates of output) made by individual producers in maximising their profits will also be consistent with economic efficiency in the sense of maximising the value that can be generated by the resources that are available to society at large.

The logic of the rule can be illustrated with the aid of Figure One. Dollar values are measured on the vertical axis and units of quantity (Q) are measured on the horizontal axis. Economics defines value as the difference between willingness to pay and opportunity cost. Willingness to pay is represented by the green bars in Figure One. These show the maximum that a particular purchaser would be prepared to pay for a particular unit of the commodity rather than doing without that unit. In Figure One, the purchaser with the highest willingness to pay (WTP) is prepared to pay $10, the purchaser with the next highest WTP is prepared to pay $8, and so on. So long as the prospective purchaser is willing to pay more than the cost of producing an extra unit of a commodity, then that extra unit should be produced. Figure One suggests that 4 units of this commodity should be produced because for each of those units the WTP of a purchaser exceeds the additional cost to society of producing that unit. The fifth unit should not be produced because the WTP of the purchaser is less than the cost to society of producing that unit.

[2] The history of the proposition is surveyed in N Ruggles, "The Welfare Basis of the Marginal Cost Pricing Principle, *Review of Economic Studies,* vol 17, 1949, and N Ruggles, "Recent Developments in the Theory of Marginal Cost Pricing", *Review of Economic Studies,* vol 17, 1949.

The encouragement of the economically efficient use of infrastructure

Figure 1: The logic of the marginal cost rule
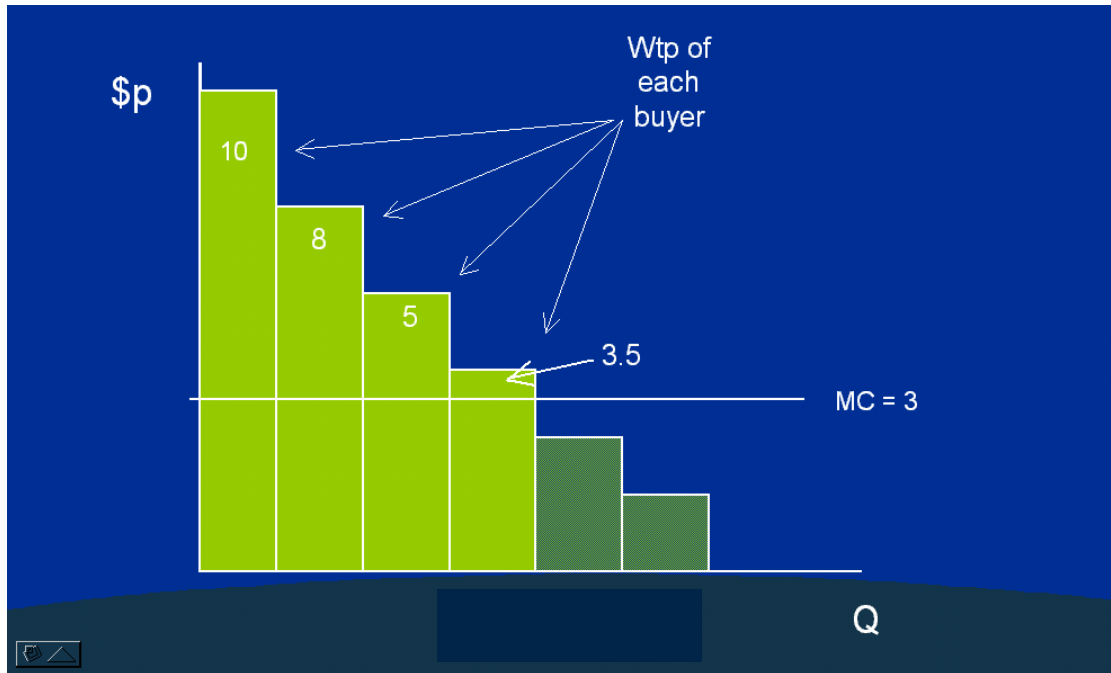
The rule that price should be set at marginal cost can now be explained. By setting the price at $3, only four units of the commodity will be purchased. The fifth unit will not be purchased because the fifth purchaser would not be prepared to pay a price as high as $3. If the price were set at $3, prospective purchasers would, in effect, be forced to pay a price equal to the cost that they would impose on society as a result of their decision to consume that unit of the commodity. So, when making a decision whether or not to consume a unit of the commodity, the consumer will incur all the costs and benefits that accrue to society as a whole. The consumer will make a decision in his or her best interests that will coincide with the decision that is efficient from the point of view of society as a whole.

2.3   THE ANALYSIS OF 7.1.2 OF THE DRAFT DECISION USES THE WRONG NOTION OF COST

Section 7.1.2 of the Draft Decision is the Commission's assessment of whether declaration would be likely to encourage an efficient use of telecommunications infrastructure. As was noted above, this section argues that prices should reflect 'costs'. As can be seen from section 2.2 above, the standard reasoning of economics indicates that the relevant cost notion is marginal cost – that is, the

The encouragement of the economically efficient use of infrastructure

cost of a decision to use a given amount of infrastructure to produce one extra unit.

It cannot be stressed too strongly that all costs in economics must be related to decisions. The decision that the Draft Decision is analysing in section 7.1.2 is the decision to use a given amount of telecommunications infrastructure to produce a greater or lesser number of services. The cost that society incurs as a result of that type of decision is known to economists as short-run marginal cost. It is defined as the cost of producing one extra unit of service using a given stock of capital equipment.

Chapter 7 of the Draft Decision does not explicitly say what notion of cost it is using. The notion of cost used in Chapter 7 becomes clear when one reads Chapter 8. It then becomes clear that the cost that was being referred to in Chapter 7 is total service long-run incremental cost. This is very different from the notion of cost that standard economics states is relevant to the decisions that are being analysed in Chapter 7.

The starting point of the economic analysis of the efficient use of telecommunications infrastructure (or, indeed, any type of infrastructure) has to be that (in the absence of externalities, fixed costs and common costs) prices should be set at short-run marginal cost. By starting its reasoning from a notion of TSLRIC notion of costs, the Draft Decision has been led into error.

2.4   THE SETTING OF PRICES AT MARGINAL COSTS MAY NOT BE CONSISTENT WITH THE RECOVERY OF TOTAL COSTS BECAUSE OF THE PRESENCE OF FIXED AND COMMON COSTS; IN THIS CASE, ECONOMIC EFFICIENCY IS ENCOURAGED BY MARKING UP PRICES ABOVE MARGINAL COSTS IN ACCORDANCE WITH THE RAMSEY RULES

Section 2.2 above explained the underlying logic of the basic proposition in economics that (in the absence of fixed costs, common costs and externalities) an economically efficient use of telecommunications infrastructure will be encouraged by prices that are set at marginal costs. Although the marginal cost rule is regarded by economists as the starting point of any discussion about efficient prices, economists rarely advocate the setting of prices equal to marginal costs. The reason for this is that the key qualifying assumptions (zero fixed costs, zero common costs and zero externalities) are rarely met. The result is that marginal cost has to be adjusted to make allowance for these other factors.

Marginal costs are the extra opportunities that are forgone as the result of a decision to produce an extra unit of output. If this decision assumes a given telecommunications infrastructure, the costs incurred in building that infrastructure will not be included in marginal costs. These costs will not vary as a result of a decision to produce an extra unit of service with a given infrastructure. The costs incurred in building the infrastructure are said to be

The encouragement of the economically efficient use of infrastructure

fixed with respect to that decision. If prices are equal to marginal costs, the fixed costs of building the network will not be recovered.

The same is true of common costs. Common costs are those that are incurred as a result of a decision to produce any one of a number of services. These costs are then said to be incurred for a number of services in common. These costs will not be affected by a decision to produce an extra unit of a mobile service. That is, there will be no contribution to these costs by a mobile service if its price is set at marginal cost.

The Draft Decision notes that a submission prepared by Professor Gans and Professor King of the University of Melbourne advocates the setting of the price of a mobile termination service at marginal cost. This is dismissed by the Draft Decision because such a price would not enable the recovery of fixed and common costs:

> The Commission does not believe basing mobile termination prices on a SRMC pricing principle would be in the LTIE because it would take no account of the long-run costs a mobile operator incurs when it provides mobile termination services to access seekers. Accordingly, such a pricing principle would not account adequately for the legitimate business interests of access providers and is otherwise inconsistent with the LTIE.[3]

Economics has a well-established method for supplementing marginal costs so as to allow for the recovery of fixed and common costs – in such a way as to minimise any damage that such a departure from marginal-cost pricing might do to efficiency. The rules for the efficient supplementation of marginal costs are known in economics as the Ramsey rules.[4]

The underlying logic of the Ramsey rules can be explained with reference to Figure One. Although a price of $3 will enable the recovery of marginal costs, it may be that the minimum price that would enable the recovery of all costs would be $4.5. That would then be the Ramsey-optimal price. It is defined as the price that would enable the recovery of all necessary costs and cause the least reduction in economic efficiency compared with a price that was set at marginal cost.

In many cases, the application of the Ramsey rules is more-complicated than this. If some common costs need to be incurred in order to generate multiple services, then the Ramsey rules suggest that the mark-up of price on marginal cost should be greater for those services which are relatively price-inelastic. This means that the mark-up should be greater where it causes the least reduction in quantity. The logic behind this is simply that efficiency is best encouraged (consistent with enabling the recovery of all necessary costs) if prices are marked up where they

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[3] Draft Decision p 162.

[4] A survey of the origin of these rules is provided by William J Baumol and David F Bradford, "Optimal Departures from Marginal Costs Pricing", *American Economic Review,* June 1970, 265-83.

The encouragement of the economically efficient use of infrastructure

cause the least possible departure from the allocation of resources that would result from the implementation of the marginal cost rule.

2.5   THE DRAFT DECISION ALLOWS FOR FIXED AND COMMON COSTS IN A WAY THAT DETRACTS FROM EFFICIENCY

As was noted in section 2.4 above, economics teaches that efficiency is best encouraged by marking up prices above marginal costs in accordance with the Ramsey rules. The Draft Decision has chosen to ignore this precept of economics by proposing that prices should be set at total service long-run incremental cost (TSLRIC).[5]

The Commission defines TSLRIC as follows:

> TSLRIC is the incremental or additional costs the firm incurs in the long term in providing the service, assuming all of its other production activities remain unchanged. It is the cost the firm would avoid in the long term if it ceased to provide the service. As such, TSLRIC represents the costs the firm necessarily incurs in providing the service and captures the value of society's resources used in its production.

> TSLRIC consists of the operating and maintenance costs the firm incurs in providing the service, as well as a normal commercial return on capital. TSLRIC also includes common costs that are causally related to the access service.[6]

As has been stressed throughout this Report, economic costs must be related to decisions. TSLRIC is related to the decision to cease providing a service. To calculate TSLRIC one must ask: how much would a mobile provider save if it ceased to provide any mobile services? That is, the incremental cost referred to in TSLRIC is not the cost of adding only the termination service. It is the incremental cost of adding (or the cost avoided by subtracting) the mobile service as a whole. This cost is then averaged over all mobile services (in an arbitrary manner) to arrive at a price per minute for the mobile termination service. The price per minute cannot be referred to in economics as a cost because it is not an opportunity forgone as a result of any decision.

The costs that can be avoided by a decision not to offer mobile services are clearly fixed with respect to a decision about the rate of use of the telecommunications infrastructure. Once this infrastructure has been built, a number of different services can be produced; and these services include the services of both terminating and initiating calls. In proposing to impose a TSLRIC price for the mobile termination service, the Draft Decision proposes an arbitrary allocation of these fixed and common costs that is quite contrary to the Ramsey rules.

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[5] *Draft Decision* pp 162-5. It appears that the Commission arrived at its objective of 12 cents per minute not through any independent investigation of its own but by relying on data in the MCI submission.

[6] Australian Competition and Consumer Commission, *Access Pricing Principles,* July 1997, p 28.

The encouragement of the economically efficient use of infrastructure

Section 2.4 of this Report explained that the Ramsey rules show how fixed and common costs can be recovered so as to encourage economic efficiency. These rules require that fixed and common costs be recovered from those services where the recovery does least harm to economic efficiency. The Draft Decision proposes to ignore these rules and to allocate the fixed and common costs of the mobile services equally across each minute of mobile service.

The Draft Decision does discuss the Ramsey rules.[7] However, this discussion is only in the context of dismissing submissions from mobile carriers that current prices approximate those that are Ramsey-efficient. Having dismissed these arguments, the Draft Decision proposes to impose prices that pay no regard to the Ramsey rules at all. This is contrary to the teaching of economics. If the Draft Decision were to argue that its regulation of termination charges were to encourage the efficient use of telecommunications infrastructure, it should be able to argue that its prices were closer to the Ramsey rules than would be current prices.

Economics teaches that fixed and common costs can be recovered in a way that encourages the efficiency with which telecommunications infrastructure is utilised. This involves the application of the Ramsey rules. These rules enable the marking up of prices on marginal costs in such a way as to minimise the loss in economic efficiency caused by raising prices above marginal cost. The Draft Decision proposes not to follow this lesson of economics but to substitute a marking-up that violates the dictates of economics.

2.6   IN ADDITION TO THE ADJUSTMENT OF PRICES NEEDED TO ALLOW FOR THE RECOVERY OF FIXED AND COMMON COSTS, PRICES MAY ALSO NEED TO BE ADJUSTED TO ACCOUNT FOR EXTERNAL EFFECTS

The economic literature on the allowance for external effects dates from the 1920s and 1930s – the same period as the development of the marginal cost pricing rule and the Ramsey rules for marking up marginal costs so as to allow for the recovery of fixed and common costs. The seminal work in the literature of externalities was AC Pigou's *Economics of Welfare,* between 1920 and 1932.

The marginal cost pricing rule is based on the idea that, by setting price equal to marginal cost, the prospective purchaser will be confronted by the costs and the benefits that accrue to society as a result of his or her consumption decision. The cost of the decision is reflected in the price and the benefit of the decision is equal to the willingness to pay of the prospective purchaser.

Pigou showed that there may be costs and benefits in addition to those that are included in the willingness to pay of the purchaser and the marginal cost to the producer. He labelled these additional costs, 'external costs'; and he labelled the

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[7] See *Draft Decision,* pp 137-8.

The encouragement of the economically efficient use of infrastructure

additional benefits, 'external benefits'. Pigou argued that external costs and benefits can be included in the calculus of economic decision-makers by means of taxes and subsidies. To the extent that a purchasing decision generates an external benefit, the prospective purchaser should be subsidised; and, similarly, the prospective purchaser should be taxed to the extent that any purchase decision will generate an external cost. These taxes and subsidies will then ensure that (as with the simple exposition of the marginal cost pricing rule) the prospective purchaser will bear all the costs and benefits of his or her decision.

2.7   THE DRAFT DECISION FAILS TO TAKE ACCOUNT OF EXTERNALITIES

The Draft Decision considers a number of submissions in which mobile service providers argued that their prices can be justified on the ground that they make some allowance for external effects. The Draft Decision rejected these arguments:

> [N]o party has provided evidence that mobile operators have sufficient incentives to set a structure of prices for mobile termination and retail mobile services that would efficiently internalise any relevant mobile network externalities. In the usual case, the existence of externalities is seen as a cause of market failure and hence a rationale for intervention in a particular market. This is because neither consumers nor firms have an incentive to efficiently internalise the existence of externalities in their consumption and production decisions. In this instance, no party has provided the Commission with any evidence or analysis to suggest that the profit-maximising incentive the Commission expects would drive pricing decisions for mobile termination and retail mobile services would drive mobile operators to set a structure of prices that would conform with an efficient use of telecommunications infrastructure. Accordingly, the Commission does not believe it has been presented with any compelling arguments with regard to mobile network externalities that suggest declaration would not promote an efficient use of the infrastructure used to provide telecommunications services. [8]

From this passage, it is clear that the Draft Decision considers the standard Pigovian argument for taxes and subsidies to ensure that potential purchasers consider the full costs and benefits of their decisions. Indeed, it seems to suggest that declaration would promote the efficient use of infrastructure by enabling the Commission to allow for external effects when it regulates mobile termination prices – in contrast to the current prices where it has not been convinced that these external effects are being taken into account.

This argument (in Chapter 7) is in stark contrast to what the Draft Decision does in Chapter 8. In Chapter 7, the Draft Decision appears to argue that declaration would encourage the efficient use of infrastructure by enabling prices properly to be adjusted for external effects. However, in Chapter 8 the Draft Decision arrives at a (draft) decision on prices that makes no allowance for externalities at all.

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[8] *Draft Decision,* p 137.

The encouragement of the economically efficient use of infrastructure

2.8 CONCLUSION ON EFFICIENCY OF USE OF THE INFRASTRUCTURE

The Draft Report fails to follow the standard precepts of economics when assessing the effects of declaration on the efficiency with which telecommunications infrastructure is used.

- Standard economics says the starting point of any assessment of prices should be that the efficient use of infrastructure is promoted by setting prices at marginal cost whereas the Draft Decision takes as its starting point that prices should be set at TSLRIC.

- Standard economics says that economic efficiency is encouraged if service providers recover their fixed and common costs by marking up their marginal-cost prices according to the Ramsey rules whereas the Draft Decision allows for (some) fixed and common cost by an inefficient averaging of fixed and common costs over all mobile services.

- Standard economics says that economic efficiency is encouraged by a further adjustment of prices to allow for external costs or benefits whereas the Draft Decision makes no allowance for external costs and benefits.

The encouragement of the economically efficient use of infrastructure

3 The encouragement of efficient investment in infrastructure

Although the Draft Decision analyses the efficient use of infrastructure at some length, it confines its views on efficient investment in infrastructure to a few pages. The substance of these pages is heavily reliant on the analysis of price distortions that the Commission claims to have identified when analysing the use of infrastructure.

The Draft Decision has what it characterises as 'three major concerns' about the effect of the relative prices of termination services and initiating services on investment in infrastructure.

3.1 FIRST CONCERN OF THE ACCC: THAT PROFITS FROM MOBILE SERVICES ARE TOO HIGH

This concern flows from the evidence of profits in Chapter 5 of the Draft Decision. It is noteworthy that, when the Draft Decision raises this issue in the context of investment, it acknowledges that investment (and, one supposes, entry) cannot be undertaken in the termination activity alone. Rather, investment is 'investment in mobile telephony infrastructure as a whole'.[9]

The concern in the economics literature with high rates of return might be translated into the context of mobile telephony as follows: barriers to entry to the mobile telephony market (the market that is implicitly adopted on p 145) are so high that incumbents are able to restrict the extent of investment in mobile telephony networks and, thereby, generate a higher rate of return than would be available in a more-competitive market.

Evidence of such a high rate of return would have to be evidence that the rate of return on funds invested in mobile networks can be sustained at a higher than a competitive rate. The Draft Decision contains no such evidence. The evidence of the Draft Report seems to be that, in the year 2000, Telstra earned a high rate of return on capital. The returns to other providers are much less attractive.

However, economics does not suggest that a high rate of return for a short period of time or for a single firm is any cause for concern. Rather, economics suggests that only sustained, market-wide high rates of return on funds invested indicate a lack of investment in the relevant market.

3.2 SECOND CONCERN: CROSS SUBSIDIES

The second source of concern raised by the Draft Decision is that of the 'cross subsidy' of 'retail mobile services' by the mobile termination service.[10] This piece of reasoning violates two principles of economics. In the first place, the Draft

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[9] *Draft Decision,* p 145.

[10] *Draft Decision,* p 145.

Decision seems to identify a cross subsidy whenever price is different from 'cost' – by which it seems to mean TSLRIC. This is not the definition of cross subsidy provided by the standard economic literature on the topic.

In any multi-service enterprise, such as a mobile service provider, one set of services can only be said to yield a cross subsidy if it yields revenue greater than the stand-alone costs of providing that service; and a service can only be said to receive a cross subsidy if the revenue yielded by that service is less than the incremental cost of providing that service, when all other services are already being provided.[11] It is quite clear from the context of its discussions of cross-subsidy throughout the Draft Decision that the Commission is not applying these standard definitions.

The second way in which the discussion of cross-subsidy violates standard economics is that it argues that cross-subsidies are consistent with 'fully effective competition'.[12] This appears to be a simple slip. A standard result from the contestability literature of the late 1970s and early 1980s was that cross-subsidies (when correctly defined) could not exist in competitive markets.

3.3 THIRD CONCERN: TOO LITTLE INVESTMENT IN FIXED-LINE SERVICES

The third concern that the Draft Decision raises with respect to the effect of pricing on efficient investment is that the 'inefficiently high' pricing of FTM services will lead to 'inefficiently low' levels of investment in the fixed network. The problem with this argument is the standard for an efficient level of prices.

As was explained in Part 2 of this Report, the Draft Decision has failed to use standard economics in establishing that mobile termination prices are inefficiently high. Because of this, one cannot support their conclusion that investment in the fixed-line network is 'inefficiently low'.

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[11] These definitions were originally proposed by G Faulhaber, "Cross-Subsidization: Pricing in Public Enterprise", *American Economic Review,* December 1975, vol 65, pp 966-77 and have since been generally adopted by the profession.

[12] *Draft Decision,* p 145.

The encouragement of efficient investment in infrastructure

4 Conclusions

The Draft Decision argues that declaration would encourage efficiency in the use of and investment in telecommunications infrastructure. This argument violates standard economics in two broad ways.

In the first place, the Draft Decision fails to follow the standard economic methodology for assessing whether prices encourage the efficient use of infrastructure. This methodology demands that efficient prices are those that (i) allow for externalities; and (ii) mark-up marginal costs in accordance with the Ramsey rules so that efficient firms can recover fixed and common costs. This methodology has not been followed by the ACCC.

The second way in which the argument of the ACCC violates standard economics is that it claims that declaration will encourage efficiency merely because it has identified ways in which the current pricing of mobile services is not perfectly efficient. This is known in economics as the 'grass is greener fallacy'.[13] It is illogical to reason that if a market is not working perfectly then a regulator will make it work better.

In this case, Chapter 8 of the Draft Decision has foreshadowed how the regulator would work. It would not base prices on marginal costs; it would not facilitate the recovery of fixed and common costs according to the Ramsey rules; and it would not allow for externalities. The Draft Decision offers no reason to suppose that the resulting regulation would encourage economic efficiency.

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[13] The phrase was introduced into economics by Harold Demsetz, "Information and Efficiency: Another Viewpoint", *Journal of Law and Economics,* April 1969.