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# CROSS-SUBSIDISATION OF RURAL AREAS VIA UTILITY PRICING POLICIES*

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**Public utilities which apply roughly uniform prices to all consumers often engage in cross-subsidisation—charging prices which are below cost for consumers in low population density areas but above cost for consumers in high density areas. The distributional and allocative implications of this practice are examined and it is concluded that *some* cross-subsidisation may be justifiable on welfare grounds even where no externalities exist. There is, however, little empirical evidence released by utilities to enable assessment of the efficiency of their practices. If nothing else, we highlight the need for greater public disclosure of pricing practices by public utilities.**

## *Introduction*

One characteristic feature of some public utilities, particularly those supplying gas, water or electricity services, is that they have monopoly powers over a wide geographic area.[1] Moreover, pricing is usually fairly uniform even though the cost of the service may vary significantly in one area compared to another: in the absence of congestion costs, it is generally the case that the cost of supplying customers in low density areas (e.g. farming districts) is higher than that of supplying customers in high density (urban) areas.[2]

Any failure to charge a price in one area which bears the same relationship to costs as that existing in other areas has implications for both the distribution of income and the efficiency of the allocation of resources.[3] A pricing policy which takes inadequate account of the difference in supply cost can result in cross-subsidisation from low-cost consumers to

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[1] An elementary discussion of public utility pricing can be found in Musgrave and Musgrave (1980, Ch. 34).

[2] Until the congestion costs in inner city areas become high, it is cheaper to increase the density of a service in a particular area than to expand the service into new areas where the customers are widely dispersed. Support for this contention can be found in Turvey (1971), Mushkin (1972), Davis and Hanke (1973) and Wells (1977). Although our work concentrates on differences in customer density, similar supply cost differences can result if consumers in one area live in difficult terrain compared to those elsewhere. Similarly, even the density factor may be more appropriately expressed in terms of urban versus broadacre (or farming) consumers, rather than the metropolitan and rural comparison used here. However, for the purpose of illustrating the problems involved, the spatial division used appears to be adequate.

[3] Little (1957, p. 279) argues that '. . . welfare theory is sufficiently realistic to tell us that relative costs of production should not be allowed to get too far out of line with relative market prices'.

high-cost consumers of the utility's services (if the service, on average, is self-financing) or from non-consumers to consumers (if deficits are financed from general revenue). In effect, cross-sudsidisation involves the application of a form of excise tax on low-cost consumers (or levy on non-consumers) with the proceeds used to subsidise the consumption of consumers in high-cost areas. Such a pricing policy will not only have an impact upon consumers, but also may influence the investment plans of the utilities themselves.

The concept of cross-subsidisation is investigated with particular reference to the pricing policies of Australian public utilities that operate in both metropolitan and rural areas. Although much of the evidence is incomplete, there is sufficient information to show that there is considerable cross-subsidisation of rural consumers at the expense of those who consume the utility's services in metropolitan areas.

We begin by outlining the general features of a policy of cross-subsidisation through public utility pricing behaviour. Although there are a large number of public utilities in Australia, the applied analysis is confined to only a few fairly representative public utilities. These are in the areas of telephone, electricity and water and sewerage services. Only *one* public utility could be found that releases sufficient information to make even the broadest estimate of the extent of cross-subsidisation that takes place between metropolitan and rural consumers. We argue the case for greater public disclosure of, and thus accountability for, the extent of spatial cross-subsidisation that occurs in Australia.

## *Spatial Cross-Subsidisation: The General Case*

The clearest illustration of cross-subsidisation is one in which consumers in low-cost areas pay a price in excess of cost, sufficient to offset the losses in high-cost areas, so as to allow the utility to break-even, or make some overall profit. However, the definition need not be so narrow. So long as the price-cost ratio differs from area to area, the potential for some cross-subsidisation always exists. For example, there may be cross-subsidisation even when the utility operates at a loss. *Some* consumers in some areas may be paying a price in excess of their costs, albeit insufficient to offset the losses elsewhere.

There is an important analytical difference to be drawn between subsidies which apply to the cost of providing access to a service (e.g. connection to the telephone or electricity transmission system) and those which apply to consumption of the service itself (e.g. per telephone call, or per unit of electricity consumption). The former are in the nature of 'lump-sum' subsidies, and the latter are 'per unit' in nature. For illustrative purposes the consumption subsidy type is considered. However, the real world examples used later will involve subsidies both to consumption and to access. We also assume, for analytic convenience, that units of supply are of homogeneous quality: this too can be relaxed where necessary.

A diagrammatic representation of the cross-subsidising effect of uniform pricing when supply costs differ by geographic area can be shown by adapting Turvey's (1971, p. 97) diagram for electricity supply pricing. It is assumed in Figure 1 that there are only two categories of customer: those in low density, high-cost areas and those in high density,

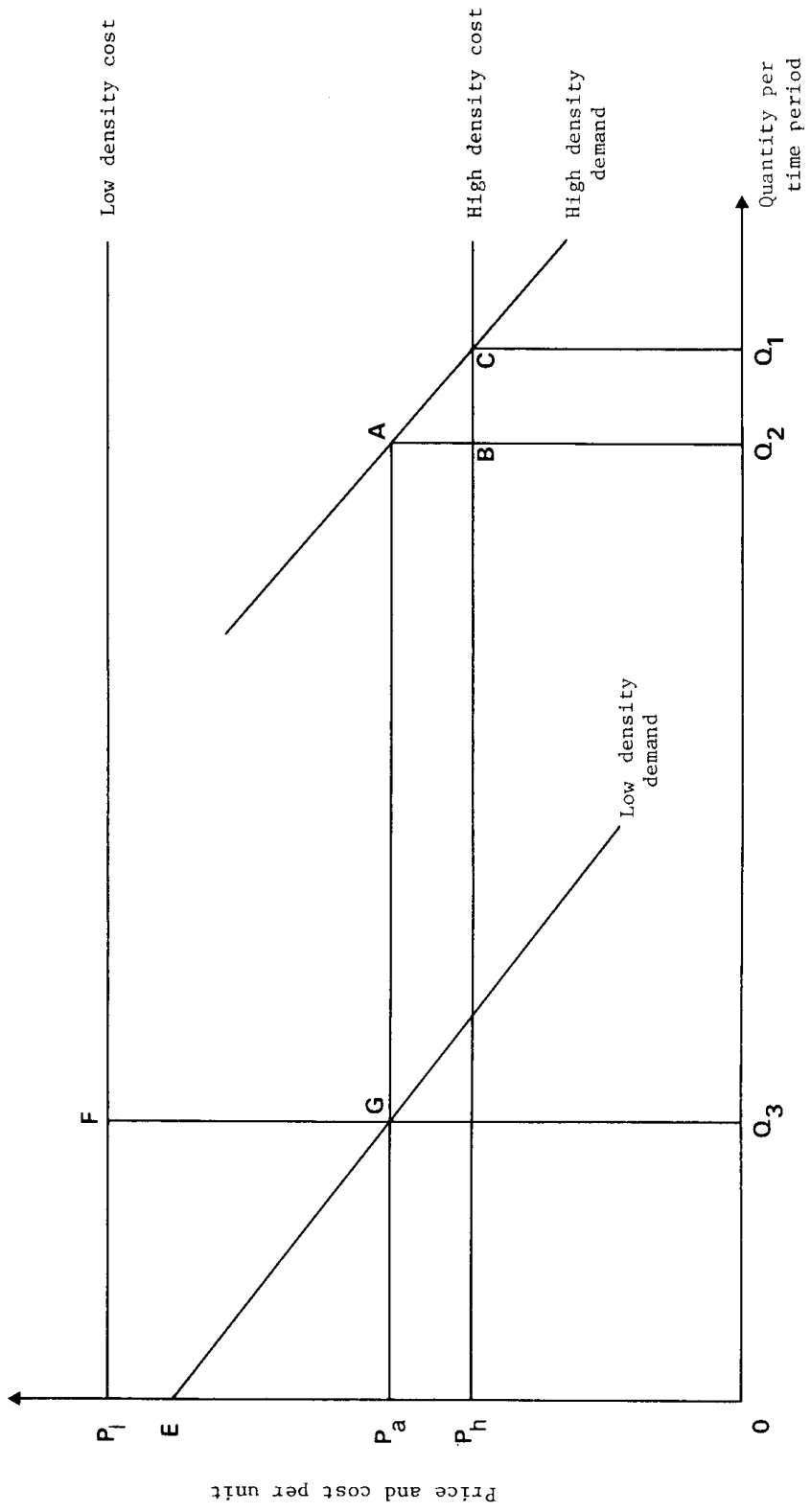


Figure 1 - Public utility uniform pricing.

low-cost areas. Furthermore, it is assumed that the utility's management is either unable or unwilling to identify other than the average cost by area. Each has some assumed demand schedule as well as an identifiable, and different, average unit cost, assumed for convenience to be constant and, hence, equal to marginal cost.[4]

If there were no price equalisation, customers in the high density (low-cost) area would demand $OQ_1$ units of service at a price per unit of $OP_h$. Those in the low density (high-cost) area would demand none since the average cost price, $OP_l$, is above their demand schedule at all levels of demand. If a price were selected, such as $OP_a$, where the surplus revenue from high density consumers covers the deficit from low density consumers $[OQ_2\ (P_a - P_h) = OQ_3\ (P_l - P_a)]$ then the demand in the low density (high-cost) area would be $OQ_3$, while that in the low-cost area would fall to $OQ_2$. The subsidy per unit supplied to high-cost consumers of $P_lP_a$ would be met by an increase in the price paid by low-cost users of $P_aP_h$ per unit. That is, the high-cost consumers gain consumer surplus measured by the area $EGP_a$ at the expense of a loss of surplus to low-cost consumers of the area $OQ_2\ (P_a - P_h)$, plus the small triangle $ABC$.

The *redistributional* effects of cross-subsidisation like that shown in Figure 1 can only be gauged in terms of the general impact upon all consumers in each of the broadly defined geographic areas. In the case illustrated, a transfer of $P_hP_a\ AB$ occurs from low-cost to high-cost consumers. The redistributional effect upon individuals is most uncertain. For example, some of the customers in low-cost areas required to pay a loading on their price in support of consumers in high-cost areas, may have less private income and wealth than many of the high-cost consumers who may earn relatively high incomes and/or own a substantial stock of wealth. If there is any felt need on the part of governments to redistribute income in favour of certain specified categories of individuals (e.g. farmers or more specifically, low-income farmers) then it may be preferable to use more selective direct measures than to resort to cross-subsidisation through public utility pricing policies. Even in the case of a progam of redistribution specifically intended to benefit all people living in designated areas (e.g. the isolated) regardless of income or wealth, there would appear to be good reasons, on ethical grounds, for financing subsidised services from general revenue rather than through the imposition of what is, in effect, a tax on other consumers of a utility's services.

Furthermore, the redistributing effects of a sustained policy of cross-subsidisation can only be temporary. In the long run, the anticipated subsidy (or loading) will be capitalised into the value of the asset they serve: namely, the factor of production, land. 'Cheap' electricity or water, for example, will exert an upward pressure on property values, while high charges for these services will exert a downward pressure on price. The initial owners at the time of any change in subsidy or surcharge will enjoy either a capital gain effect, or suffer what amounts to a 'capital levy' (Hicks, et al., 1941). Subsequent purchasers of the assets will, in an unrestricted market and with prior knowledge of these pricing

[4] While it is accepted that this type of diagram suffers from the usual criticisms applied to any static model, it serves to illustrate the fundamental issues in cross-subsidisation in a simple fashion.

arrangements, build the subsidy or surcharge into the price they are prepared to pay for the property.

On the face of it, the *allocative* effects of cross-subsidisation appear to be straightforward. Given that $P_l$ and $P_h$ measure the social costs of providing the service to low-density and high-density consumption areas respectively, lowering the price below cost to high-cost consumers generates a welfare loss of $EP_lFG$, since on all $OQ_3$ units, the value of units consumed is less than the (marginal) cost of production. Moreoever, the raising of price above cost to low-cost consumers generates the additional welfare loss of triangle $ABC$, reflecting the excess of the value in consumption of units (in the range $Q_2$ to $Q_1$) over their marginal cost in production.

In practice, however, the arguments turn out to be rather more complex. There are two primary elements in these arguments which can be clearly distinguished: namely, the issue of *externalities* associated with use of the service, and the question of *welfare* cost associated with the form of subsidisation provided.

The potential exists for external economies in the provision of most public utility services. For instance, individuals may place some value on a telephone network that reaches into all corners of Australia. However, the case for any cross-subsidisation on these grounds rests on the assumption that one group of users value the membership of another group of users more than the other way around. For example, city dwellers may be prepared to subsidise the provision of water and sewerage to neighbouring low-density land because they value the recreational potential of that land. No single city resident need be willing to pay very much for this potential improvement to make it a viable proposition. Since the provision of water and sewerage services to neighbouring areas exhibits the characteristics of a public good, it is the *sum* of the city dwellers' willingness-to-pay that is relevant. Relatedly, in the case of some public utilities, such as electricity, the extension of the service into remote or fringe areas may generate scale economies which benefit high-density consumers. In this case, subsidies from (say) city consumers that provide access for country consumers may be justified.

Two observations must, however, be made. First, if the external economies to low-cost consumers derive from providing *access* to services for high-cost consumers, the relevant subsidies should clearly be lump-sum in nature. There is no case here for subsidies which reduce the per-unit cost of consumption by high-cost consumers, nor for raising per-unit price above marginal cost (per unit) for low-cost consumers. Indeed, in general it is important to be sure that the correct form of cross-subsidisation is employed. Second, it is important to know whether the external economies accrue to low-cost consumers alone, or to all individuals outside the high-cost area, whether consumers of the service or not. If the latter is the case, then it might be argued that some of the subsidy should come from general revenue (raised from taxes on all individuals) rather than from 'taxes' (i.e. higher prices) on low-cost consumers alone. In any event, the value of the external economies that may be attributed to consumption of a particular service by high-cost consumers is not readily observed or observable. But at the very least, we should endeavour to estimate the distribution of costs and the size and nature of the cross-subsidisation involved, and then judge whether the

actual situation conforms to a 'best estimate' of the division of private and public benefits.

However, even if this is done, a problem remains. In some cases, there may be no argument for cross-subsidisation on externality grounds, but for other reasons, governments may wish to continue to subsidise high-cost consumers. In other cases, it may be that the relevant externality is one which applies to all individuals, and not simply to low-cost consumers of the service. In either event, it may appear superficially attractive to argue that subsidisation of high-cost consumers should occur from general revenue rather than from higher prices applied to low-cost consumers. The basis for this line of argument is that raising the price to low-cost consumers imposes a welfare loss on those consumers in excess of the revenue collected. In terms of Figure 1, the revenue collected is $(P_a - P_h)Q_2$, but there is an additional welfare loss measured by the triangle $ABC$ resulting from the reduction in consumption $(Q_1 - Q_2)$ because of the increased price. Such an argument would indeed be valid if there existed a mechanism for raising the required revenue with no such welfare cost. But in reality there is no genuine lump-sum (i.e. non-distorting) method of raising revenue: even income taxes involve (potentially significant) welfare costs.

Given this, it is not obvious that subsidising from general revenue is the appropriate strategy if some subsidy is to be awarded to high-cost consumers. Following the work of Harberger (1964), we can say that, if a given revenue must be raised either from an excise tax (in this context, an increase in price to low-cost consumers) or from a broad-based tax system (general revenue), it is generally reasonable to assume that the welfare cost is least when the broad-based taxes are used.[5] However, this fundamentally important result is based on a number of assumptions that may not always apply in practice.

First, the alternatives of funding subsidies from general revenue sources or through cross-subsidies from low-cost consumers may not involve identical revenue requirements. For example, if governments insist on complete price-equalisation, a larger subsidy must be paid to high-cost consumers if general revenue financing is preferred to cross-subsidisation (in Figure 1 price would have to be $P_h$ for all consumers, thus requiring a larger per-unit subsidy to high-cost consumers and a larger output over which that subsidy is to apply). Thus, the welfare cost of over-expansion of consumption by high-cost consumers is higher than under cross-subsidisation and the revenue to be raised to cover the subsidy from general revenue is larger than the revenue that would have to be raised for simple cross-subsidisation. Hence, there can be no presumption that the Harberger result will apply in this case. However, to the extent that government is prepared to tolerate some price-differential (e.g. $P_h$ to low-cost consumers and $P_a$ to high-cost consumers), the presumption in favour of general revenue is restored.

Second, general revenue financing, particularly when it is funded from state and local authority budgets, may itself be supported by a rather narrow tax base, rather than from a broadly based income tax or sales

[5] In the simplest case of linear demand curves, welfare cost is a quadratic function of the size of the price distortion. *Ceteris paribus*, a large number of small taxes will yield a given revenue with less aggregate welfare cost than one large tax (see Harberger 1964).

tax as Harberger presumed. In this case, the welfare cost associated with general revenue funding compared with that involved in cross-subsidisation is much less obvious. Much depends on the types of tax that provide general revenue and, in particular, the elasticities of demand associated with them relative to the low-cost consumers' elasticity of demand for the services of the public utility.

Finally, though perhaps most important of all, governments are not limited to an 'either/or' choice between general revenue or cross-subsidisation to achieve price equalisation: they could combine elements of both. In fact, the optimal arrangements for providing a given subsidy to high-cost consumers would involve equalisation of the marginal welfare cost of each potential source of revenue, and in general this might require the use of both general revenue-financed subsidies and cross-subsidisation. The 'ideal' combination would vary from case to case, depending upon relative elasticities of demand. Clearly, it could not be expected that governments would be willing or able to calculate precisely the ideal arrangement, but that fact does not imply that they will or should resort to single-source financing. *Some* cross-subsidisation may be justified on allocative grounds in many cases.

All-in-all, the allocative issues relating to cross-subsidisation are evidently not as straightforward as many seem to believe. Some cross-subsidisation may be justified on externality grounds and some may be justified even when such externalities do not exist or are irrelevant. Ultimately, however, the issues involve empirical questions that can only be tackled with detailed information on a case-by-case basis—information that is currently rarely available.

### *Cross-Subsidisation in Australia: Some Evidence*

Although every state in Australia has its own cluster of public utilities, each serving widely dispersed geographic areas, while the Commonwealth has utilities such as the Australian Telecommunications Commission (Telecom) and the Australian Postal Commission supplying services throughout Australia, only one public utility could be found which has even the most elementary set of publicly available figures on the spatial division of costs and revenues.[6] This is the South Australian Engineering and Water Supply Department (E & WS) which shows costs and revenues by two geographic areas: 'metropolitan' (the statistical boundary) and 'country'. Nearly all utilities include general comments in their published reports about the high cost—and losses—in rural areas, but none other than the E & WS are prepared to specify these losses publicly in sufficient detail to make even the most crude estimates of the extent of cross-subsidisation that takes place.[7]

The three types of utilities discussed below are illustrative only. Telecom was selected because of its Australia-wide operations and because of the characteristic that users of the service (as distinct from society in general) enjoy private benefits because others use the service as

[6] The Australia-wide survey was carried out in October 1979 by the first-mentioned author.

[7] Telecom's management was prepared to concede in correspondence that they have made broad estimates of the spatial cross-subsidisation existing in Australia, but they are not prepared to make that information available to the public.

well. Electricity supply, the second type of utility discussed, is characterised by central generating plants with power being distributed through a network of transformers and cables to consumers in areas of varying population density, but at uniform—or near uniform—tariffs. Finally, some results are shown for the E & WS since this utility provided us with some data to comment upon.

*Telecom Australia*

As with the Australian Postal Commission, Telecom is required, under Section 73 of the Tele-communications Act 1975, to raise sufficient revenue to cover operating costs and at least half the cost of capital works. The Australian Telecommunications Commission (1979*b*, p. 4) sees its task '. . . to make its service available throughout the country so far as is reasonably practicable'. However, it does not automatically follow from this that the expansion of the network should be funded only by cross-subsidisation.[8] Undoubtedly Australians enjoy external benefits from a telephone network that joins the cities and country areas. In the absence of evidence that either rural subscribers or urban subscribers enjoy more external benefit from this communication capacity than the other, the case is as much one for a general public subsidy as it is for cross-subsidisation from urban to rural subscribers.[9] Existing technology may suggest that there are net benefits in increasing the density of subscribers once a network has been established, but this may apply more to the supply of services in fringe urban areas than in remote rural areas where the provision costs are high. In any event, any benefits of increasing the density of services in fringe, low density areas relate to *access* costs, not the per-unit cost of using the service. The subsidy would be applied at the time the new subscriber applied to be connected to the telephone network. How much benefit existing subscribers put on this quality factor cannot be easily measured, especially if the benefit expected by low-cost subscribers is area specific. We can simply question whether the cross-subsidisation that does exist is more or less than our estimate of the private benefit enjoyed by low-cost subscribers.

Although Telecom refuses to release estimates of costs and receipts by geographic area, their published reports (1978, p. 18) make frequent reference to the losses in country areas. The Australian Telecommunications Commission's review (1976, p. 135) to the year 2000 notes that the rates applied in rural areas are often '. . . in direct conflict with the incidence of costs', with the result that, '. . . the adverse effect on profitability tends to increase with time as the low tariff stimulates a greater demand which often has to be met at the expense of profitable services'.

Notwithstanding these effects, Telecom continues to embark upon programs of expansion in rural areas, while at the same time reducing the price for rural subscribers, both for units consumed and for connection

[8] Hazlewood (1968, p. 239) argues that, while a public telephone service should be available to all potential subscribers, each new subscriber should bear the full cost of its provision if it is at all possible to estimate this cost.

[9] The opinion of the Commission of Inquiry into the Australian Post Office (Australian Parliament 1974, pp. 232 and 338) was that external benefits should be financed from the Government's consolidated revenue and not by cross-subsidisation from other subscribers.

to the telephone network. Two of the most important rural pricing innovations to be actually implemented[10] are the 'Community Access 80' program and the extension of the free line entitlement for new rural subscribers from 12 km to 16 km. Community Access 80 (Australian Telecommunications Commission 1979*a*) is a program designed to reduce the cost of telephone calls in rural areas. Its most important feature is that former trunk calls for distances about 80 km from country towns designated as the business centre, are now only charged at local call rate for each three minutes. The Australian Telecommunications Commission's (1979*a*, p. 9) conservative estimate of the cost (in 1978 dollars) for the first year of operation was $15m.[11]

Extending the free line entitlement to 16 km means that probably something less than 10 per cent of new rural subscribers will contribute to the capital cost of connecting them to the telephone network.[12] If a new rural subscriber is located beyond the free line entitlement, the cost-recovery charge is limited to a ceiling on annual rental of $500.

*Electricity*

McColl's (1976) comprehensive review of Australian electricity utilities is typical of other works in this area in that little mention is made of spatial cross-subsidisation. Most of the discussion of pricing is confined to the peak load problem: 'Discussions of electricity pricing (e.g. McColl, 1976) focus on the implications of temporal variations in demand for pricing and investment but ignore the implication of its spatial distribution.' (Neutze and Bethune 1979, p. 78).

As with Telecom, there is no published evidence which gives a general indication of the losses in rural areas that are subsidised by profits in low-cost urban areas. However, some rural subsidisation is clearly evident and McColl's (1976, p. 78) conclusion remains true that '. . . the general procedure appears to have been to require consumers to bear part of the capital costs, and to meet the balance of the cost from state budgets or from electricity revenue in general'.[13] The Western Australia State Energy Commission supplies consumers over widely scattered rural areas at uniform tariffs. They note that the losses from this uniform pricing policy must be met by raising the average tariff applied to all consumers: 'The Commission's Standard Electricity tariffs could be 5 to 6 per cent lower were it not for this loss', (1978, p. 2).

[10] The *Australian Financial Review* of 17 October, 1979 reported that Telecom was to spend $500m converting manual exchanges in country areas to automatic exchanges. Also, the domestic satellite system used for the provision of both telephones and television services in remote areas was to cost around $200m. This latter example illustrates the rapid technological change taking place in telecommunications which could alter the relative cost of these services in remote areas.

[11] The estimates make no allowance for the fact that the lower price for telephone services in rural areas could lead to an increase in the demand for telephone connections in these areas.

[12] This estimate was made by officers of the United Farmers and Stock-owners of S.A. in private discussion and is based upon the population density and distribution of telephone exchanges in most rural areas of Australia.

[13] One can only draw inferences from individual cases. For example, the formula used for calculating the 'standing charge' for the capital cost of connecting new consumers in S.A. is such that, even by ignoring the 'four pole' free exemption (and transformer), the annual charge is insufficient to cover the interest on capital at current rates, let alone repay any principal. Furthermore, this annual charge is limited to a period of 10 years.

Only the Queensland Government has a publicly declared policy of deliberate cross-subsidisation from metropolitan to rural consumers. The Queensland Electricity Act [Sec. 64(3)] requires the Commission to '. . . have regard to and proceed towards the objective of progressively equalising throughout the State the price to be paid by the consumers . . .'. To this end, the Commission has been able to report (1978, p. 22) that:

> further movements towards State-wide tariffs' uniformity have been made. Considerable tariff uniformity within individual Electricity Boards' areas has now been achieved, with charges to domestic consumers in high cost western areas of the Boards being generally at the same levels as those for similar consumers in the coastal areas.

*Water and Sewerage*

Whatever the alleged external benefits of water and sewerage services which might justify a public subsidy[14], two problems remain. First, what evidence is there to show that the spillover benefits are greater in rural areas than metropolitan areas? Second, why should any excess spillover benefits that might exist in one area relative to another be financed by cross-subsidisation and not from consolidated revenue? One could conceivably argue that the spillover benefits, at least in the case of sewerage services, are greater in crowded metropolitan areas than rural areas, while the use of water as a fire suppressant in rural areas, apart from its private good character, is in many cases less of an option than it is in metropolitan areas.[15]

Notwithstanding these considerable doubts about the distribution of any alleged spillover benefits between metropolitan and rural consumers, all Australian water and sewerage authorities engage in some degree of cross-subsidisation to the detriment of high density, low-cost metropolitan consumers. Only the E & WS has attempted to publish sufficient data to give some general idea of the magnitude of cross-subsidisation that takes place. As with other water and sewerage utilities, the price charged for a new connection increases with the cost of supply. However, this extra charge is insufficient to cover costs in low density areas, while it is more than sufficient in the case of metropolitan consumers.

Some of the key figures from the 1978-79 *Annual Report* of the E & WS are shown in Table 1. It can be seen that the receipts from metropolitan consumers more than covered costs, while those from rural consumers fell short of costs. The total loss on rural operations of $19.6m was partly met from consolidated revenue ($14.8m) and partly from the surplus on metropolitan operations.

Quite obviously the E & WS could choose other mixes of subsidy to rural consumers simply by altering the price. An increase in the rural price, while leaving metropolitan prices unchanged, would reduce the

[14] In any event, not all observers are convinced that there are significant external benefits to water and sewerage services. 'We take the view that water and sewerage services are mainly private goods rather than public goods.' (Pollock and Neutze, 1976, p. 69.)

[15] Major fires in rural areas need to be fought with more than water. Fire breaks and back-burning are just two alternatives. In metropolitan areas, however, water is the dominant weapon for fighting fires.

TABLE 1

*Revenue and Receipts Metropolitan and Rural Water and Sewerage Services, South Australia, 1978-79*

| Item | Metropolitan | | Rural | |
|---|---|---|---|---|
| | Water | Sewerage | Water | Sewerage |
| Number of services | 313 410 | 330 224 | 113 481 | 32 655 |
| *Costs* | | | | |
| Operating | $24.6m | $17.6m | $18.7m | $2.8m |
| Capital[a] | $15.8m | $11.9m | $15.3m | $2.9m |
| Total | $40.4m | $29.5m | $34.0m | $5.7m |
| Cost per service | $128.90 | $89.33 | $299.61 | $174.55 |
| *Revenue* | | | | |
| Total | $44.3m | $30.4m | $16.9m | $3.2m |
| Receipts per service | $141.35 | $92.06 | $148.92 | $97.99 |
| *Surplus (Deficit)* | | | | |
| Total | $3.9m | $0.9m | ($17.1m) | ($2.5m) |
| Profit (Loss) per service | $12.45 | $2.73 | ($150.69) | ($76.56) |

*Source:* South Australia Engineering and Water Supply Department (1979).
[a] Includes loan repayments.

total subsidy to rural consumers and alter the proportion of support funded through cross-subsidisation. The S.A. Government has recently attempted to reduce reliance upon deficit funding both by increasing the user-charge to rural consumers and by increasing the price to surplus units (metropolitan consumers) as well.[16] The final outcome in terms of the mix of general revenue financing and cross-subsidisation will depend in part upon the relative price elasticity of demand for units of water in rural and metropolitan areas.

## *Conclusion*

The past pricing decisions of public utilities may be largely capitalised into property values in rural and metropolitan areas. This means that any attempt to (say) reduce the extent of cross-subsidisation could have serious adverse effects, especially upon rural property owners who purchased their properties with the expectation that the existing pricing arrangements for these services would be maintained. However, this should not stop us from questioning the efficacy of existing procedures in terms of future operations and investment decisions of public utility authorities. There is certainly some doubt about the long-term distributional benefits of past cross-subsidisation policies.

The allocative effects depend in large part upon identifying the source and value of judged externalities. On the face of it, there appears to be a

[16] The S.A. Minister for Water Resources (Mr. Arnold) announced these increases in price on 4 July, 1980. His reputed statement on page 2 of *The Australian* on that date shows that the Minister chose to ignore the contribution from metropolitan consumers. 'Losses in country areas are met from the general revenue of the State and since these losses are increasing each year, it is becoming much more difficult to find the funds to match the deficit.'

variety of externalities associated with the supply of public utility services to high-cost consumers: some relate to their access to the service; others to the per-unit supply of the service. Many of these external benefits accrue to society in general and not simply to other consumers of the service who happen to live in low-cost areas. Some mix of subsidy from both consolidated revenue and cross-subsidisation may, in fact, be entirely appropriate. Just how much support and from what source is a matter for collective judgment and this cannot begin if public utilities continue to conceal the spatial distribution of the sources and uses of funds as much as they do at present.

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