

URBAN MYTHS IN THE ECONOMICS OF WATER SUPPLY

Terence M. Dwyer, B.A. (Hons), B.Ec. (Hons) (Sydney,) M.A., Ph. D. (Harvard), Dip. Law. (Sydney)
Visiting Fellow
Asia-Pacific School of Economics and Government
Australian National University

Accuse not Nature, she hath done her part; Do thou but thine
Milton, *Paradise Lost*, Bk VIII, line 561

My thesis in this article is that Australian urban water supply and pricing policies are incompatible with rational economic thinking.

To anticipate the argument, I question the proposition that water is necessarily so scarce in Australia as to require the sorts of penal charges, water restrictions and use regulations which are being imposed or being considered for imposition upon urban users.¹ (Rural water use is a separate story, though it seems that policy failures there have been used to justify the punishment of urban water users.)

I shall illustrate the thesis by pointing out apparent logical problems with Australian Capital Territory (ACT) water supply and pricing policies.

At the outset, I wish to acknowledge that when a resource is genuinely scarce, rising prices do serve to ration demand. However, I also note that while Australia is a dry continent that fact has to be seen against Australia's relatively small population and the wide variety of regional climates. Water is not necessarily scarce in North Queensland, for example, and a policy which forbids Cairns from building a second dam when six times the volume of the existing dam flows over its spillway in the wet season may be quite irrational.

Basic propositions

In making this critique of Australian urban water supply and pricing policy I wish to start with some basic propositions, for which I assume no authority is needed. I assume that readers understand marginal cost pricing,² sunk costs and external benefits to serviced land;³ that they understand the difference between a true cost of supply and a monopoly rent.⁴ I also assume that, like Böhm-Bawerk, they understand the difference between "capital" as a factor of production and "capitalized value" representing the present worth of monopoly taxing power.⁵ In particular, I trust readers are not so beguiled by the mysteries of accounting as to confuse "profitability" with "economic efficiency".⁶

Readers will also understand how the optimality rule for marginal cost pricing and minimizing deadweight loss in public utility pricing are parallel to the problem of deadweight losses of explicit sales or income taxes.⁷ Economists understand that administered and arbitrary utility prices are really disguised taxes which impose similar deadweight losses on the community.

A. The environment is not an absolute value.

By this I mean that human activity is allowed to change the environment or even degrade it in some sense if it serves human interests. Were it otherwise, Sydney would be bush today, London would be a marshy swamp and Rome, seven hills. The point is that environmental costs must be quantified and set against environmental and other benefits. For example, it is absurd to count the costs of dams in stopping natural environmental flows if one does not count the benefit of dams in helping to sustain such environmental flows when there would have otherwise been no flow during a drought. Similarly, if one counts the lack of water flow at the Murray mouth as a cost, one has to ask how does one balance this against the city of Adelaide's demands on the River Murray.

- B. If there is no scarcity of water then marginal cost pricing represents an economic optimum

We assume here that capital has been invested to collect, store and deliver water and that, once done, available water supply exceeds demand. The only thing to be paid for is the water storage and supply infrastructure. This proposition can be traced back to Dupuit and Hotelling.⁸ It involves the corollary that pricing infrastructure to recover sunk cost or to generate a rate of return on the replacement cost of immovable assets is not economically efficient.⁹

The only real objection to marginal cost pricing is the financing problem. The objection is on the lines that "Marginal cost is a useful concept and defines a lower price for producers facing a distressed market situation. If suppliers can find ways where sunk costs are paid by a lump sum, marginal cost also becomes a useful pricing approach. But to require it as a condition of investment or to impose it after firms have sunk their capital, means foregone investment and gradual impoverishment." In other words, private sector suppliers have to recover sunk costs or they will not invest and for governments to use tax revenues to cover fixed costs of infrastructure usually creates distortions elsewhere. But as Hotelling realized, financing infrastructure through land value rates or taxes does not involve deadweight losses (he was in error in thinking deadweight losses were minimal in relation to income taxes).¹⁰

- C. If water does have a scarcity value, then the price of that scarcity should be determined by competitive markets and all users should pay the same scarcity price as a resource rent (with any adjustments for transmission wastage). The "law of one price" should prevail.

Here we assume that water demand exceeds supply. This means that in a river basin, urban users in the same basin as rural irrigators should be charged the same scarcity rent per kilolitre and vice versa. Further, if 30% of water is lost in transmission downstream then a rural irrigator downstream should pay 30% more than an urban or rural user water upstream. In other words, there is a natural comparative advantage to using water where it falls *ex caelis*, which should not be eroded by cross subsidization through prescribing identical water abstraction charges.

- D. Investment in water storage and reticulation infrastructure should be undertaken when social benefits exceed social costs.

Here again, we assume that water demand exceeds supply, given the *existing* storage and supply infrastructure *but that the storage and supply infrastructure can be augmented*. In deciding whether to augment, one should look at both public and private costs and benefits. For example, if one attaches a value to downstream or estuary fish habitats and a dam might adversely affect those habitats such adverse effects have to be weighed against potential beneficial effects such as the dam supplying water downstream in a drought and avoiding the cost to urban or rural users of a lack of water destroying or damaging parks, gardens, sports fields, crops, cattle *et cetera*.

E. Land values reflect the value of access to infrastructure.

By this I mean, for example, that land which is serviced by access to water supply will have a higher value even if no water is actually being drawn from the infrastructure. If water is available when you want it (at whatever the marginal cost of supply plus a scarcity rent, if any is applicable) then your block of land is more valuable than one without access. The recognition of this simple fact was the basis for the Australian system of rating “unimproved” land values (that is, unimproved by the landholder as opposed to society) which sought to recoup the cost of public works from the land benefited.¹¹ This may be contrasted with systems of infrastructure pricing which attempt to recover all fixed cost of infrastructure from “user pays” charges levied only on immediate users of what is carried over or through the infrastructure.

F. Land values also reflect environmental costs and benefits of human activity generally.

Environmental degradation lowers land values (eg salinization of pastures). By contrast, human efforts to conserve water and make it available for use may add value to lands. That is to say, there may be trade-offs. For example, is the increased value of cotton land upstream worth the degradation of pastures and estuary fishing areas downstream?¹²

A critique of water restrictions

We are now in a position to critique Australian urban water policy.

Typically, the de facto urban water policy which is emerging is –

1. to block construction of new dams (although the Queensland Government shows signs of abandoning the new political and economic “correctness”¹³ on this point);
2. to rely on detailed regulations and restrictions to limit and control of urban water use (e.g. no sprinkling at certain hours and no hosing of hard surfaces or windows);
3. to increase water prices generally;
4. to impose discriminatory block pricing aimed at punishing “large” household water users;
5. to use water utilities as treasury cash cows through dividends, thanks to the rising cash flows generated by 3 and 4.

I contend that each of these policies cannot be justified by orthodox economic reasoning.

1. The veto against new dams

This violates Propositions A and D. What is apparently going on is that there is an implicit acceptance by policymakers (or policy dictators?) that the environment would be catastrophically destroyed by new dams in all cases.

Perhaps some will argue that new dams are not available as a policy option because of negative environmental externalities. But this does not necessarily apply everywhere. Strangling Sydney does nothing to lessen Murray-Darling salinity problems. Claimed environmental costs should be spelled out in full cost-benefit studies in each case and weighed in alongside urban users' valuations of their living amenities, parks and gardens. Where are the cost-benefit studies proving people prefer rivers go into the sea rather than water urban parks and gardens? And is it true that Canberra's use of water takes water out of the Murray-Darling when domestic water is recycled back into the river anyway?¹⁴ Economics is about the revealed preferences of human beings – environmental preferences are only part of those preferences.

A nice example of the peculiar modern tendency to place other species as an absolute value ahead of human beings was displayed when Environment ACT defended ACT "environmental flows" (Canberra Times 10 May 2005, p 9). The argument was that a few endangered fish needed water let out of ACT dams to survive as a species. While most would not wish to exterminate fish, the idea that a few native fish need more water than some 370,000 human beings in Canberra and Queanbeyan must surely rank as bizarre.¹⁵

Australia's native fresh water fish have evolved to survive the cycles of drought and flood, so why do they need artificial "environmental flows" from dams to survive? Even if one disregards evolution, one must question how any rational cost-benefit analysis could justify a policy of providing 41 gigalitres¹⁶ in so-called environmental flows for a few fish while limiting the use of 370,000 human beings to a net 17 gigalitres.

To put the perceived needs of a few fish ahead of the conservation of trees, ovals, parks and gardens seems merely an arbitrary exercise in placing the interests of one environment (the fish one) above another environment (the one inhabited by humans). Further, *if* there were a social consensus in favour of doing so, it would follow that the costs should be borne by all taxpayers, not off-loaded onto water users alone. Presumably the fish cannot pay for their share of the dams (without which there would be zero flow in a drought anyway).¹⁷ But if Environment ACT (as their human proxy) wants water for fish, its budgetary allocation should be charged with that cost and water users given a refund so that they can fund a new dam for human use.

Without a genuine and logically consistent attempt to weigh up the social and economic costs and benefits in each case (including weighing up competing environmental claims), a veto on augmentation of urban water supply is simply an irrational dogma. If someone thinks fish are more important than human beings he is entitled to that view, but other human beings are not bound to respect it as a moral absolute which must force them to starve or die of thirst, no more than Western societies must accept the ideas that cows are sacred and not to be eaten. A veto on dams may be due to ideology, pantheist views on Nature as Deity, political pressure groups or the vested financial interests of monopoly infrastructure "owners" such as treasuries but a dogma it remains. It is, of course, possible for a modern Western society to adopt a fundamentalist pantheist agenda which forbids dams or says they must be used for fish first and last. If that genuinely reflects social preferences, an economist cannot argue with it, but he is duty bound to point out the implied social choices being made.

Taking the ACT as an example, if the social (public and private) costs of cutting consumption by quantitative water restrictions are a recurring annual \$71 million per annum,¹⁸ then at a discount rate of 10%, it would pay to spend up to \$710 million to build sufficient water storage infrastructure to be able to abolish the restrictions.

The costs of water restrictions in the most recent drought have been estimated by the ACT water corporation (ACTEW) at \$71 million¹⁹ and the cost of reducing consumption by a Government-mandated further 25% to 2023²⁰ (it has already been cut by 20% per capita since 1993-94 pricing changes²¹) is estimated at \$323 million.²² As the cost of a new dam is estimated at \$238 million (curiously increased from prior estimates)²³ it makes sense, even on the official figures, to build the Tennent Dam.

We thus see, in the case of the ACT a violation of Proposition D. The admitted costs of reducing consumption and imposing water restrictions are greater than the cost of a new dam.

A refusal to build a new dam seems to depend on a denial of Proposition A, an implicit assumption that the environment is an absolute value and nothing further should be done by human hands to alter it. Unless someone can explain what are the negative costs of a new dam, and show they outweigh the costs of not building a new dam, then the violation of Proposition A stands.

When prices rise, they do more than merely ration existing supply – they call forth new supplies. A rising water price tilts the cost-benefit ratio more and more in favour of investing in a new dam. Basic economics would dictate a new dam be built in response to shortages (unless someone can show a 100,000 water tanks and double plumbing are more cost effective).²⁴

2. Reliance on regulations and restrictions

Water restrictions necessarily violate Proposition C. They deny the legitimacy of markets in allocating resource use and claim superior economic wisdom for the policy or regulation maker. Rationing obscures, rather than reveals, preferences, just as petrol rationing did in the 1940s. Normally, economists denounce command economy measures to control consumption outside the price signal mechanism. It is therefore surprising there has not been universal condemnation by economists of proposals to regulate in the most minute detail what water users are allowed to do with the water they have paid for.

For example, if I choose to wash down my patio or drive with a hose because it does a better and cleaner job than sweeping (and runs off to water the lawn in the process) who is some officious bystander or State official to second guess my economic judgment? If I consider, that watering my garden for a good soaking 8 hours every week is better than watering it for 3 hours every second night, why should I be fined? I may actually even be using less water *in toto!*

Water restrictions, like other forms of rationing, are an inherently second-best method of dealing with shortages of supply.

3. Increasing water prices generally

Here I must assure the reader that my criticism is not that water scarcity might lead to water price increases (I have, after all, just declared my faith in price signals!). My criticism here is that water prices increases are being allowed to be dictated solely by so-called “demand management” imperatives. Prices are not rising in a way which is consistent with a free market. They are being set arbitrarily by governments and regulators. In a free market, prices are allowed to respond to scarcity, both to reduce lower-valued usage *and to draw forth new investment in water storage or recycling infrastructure*

This means that so-called demand management strategies are only half of the story. It is true that prices should rise when water becomes scarce but that is only the start of the economic story of demand calling forth supply and new equilibrium.

4. Adopting discriminatory block pricing to punish large household users

The intellectual dishonesty of appeals to water price increase as being justified by increasing scarcity becomes apparent when we examine the precise structure of price increases in urban areas. They are often notably non-uniform.

For example, in the ACT, the Independent Competition and Regulatory Commission (ICRC) has announced, in an unsurprisingly titled media release, its approval of discriminatory increases in water prices from 1 July 2005.²⁵ The fixed annual (access) charge drops from \$125 to \$75. Consumers pay 58 cents per kilolitre (kl) for the first 100 kls (previously 51.5 cents); \$1.135 per kl for the next 200 kls (previously \$1); and \$1.53 per kl for annual consumption over 300 kls (previously \$1.35).

Note that these charges are separate from the ACT Government’s water abstraction charge (which is supposed to represent the scarcity value of water as a resource and is also increased from 20 to 25 cents per kl from 1 July 2005).

Now an economist should ask some basic questions.

1. Aren’t fixed charges preferable as “lump sum taxes” to excises on output when one is looking at excess burdens of taxation? Wouldn’t even second-best Ramsey pricing dictate that the fixed charge should be as high as possible to minimize the “access deficit” or that there be declining, not rising, block tariffs, as used to occur with gas pricing?²⁶ (In fact, the ideal two part tariff charge is an access price based on a “lump sum” rating of the value of the serviced land, as Australia used to do, plus a uniform charge solely representing marginal cost, which would include a uniform scarcity rent - if there is real scarcity.)
2. If we are increasing prices on large users because of scarcity and the supposed “need” to reduce consumption, why is that not reflected in the water abstraction charge for *all* users rather than in the tariff which generates a return on capital and recurrent costs for the utility which provides infrastructure? Is it really socially costlier to supply 10 large families consuming 500 kls each than 50 smaller households consuming 100 kls each? One might have thought economies of scale operated in infrastructure supply – installing, maintaining and reading 10 connections is surely cheaper than for 50. And what about economies in consumption? A household of 6 people may use less water per capita than 6 households of one person.²⁷

3. If the justification for price increases is that water is scarce (as ICRC appears to argue), then why aren't all users to be charged the same price per kilolitre for all amounts used. Is marginal water used by a small high-income household less precious or scarce than water used by a large struggling family?
4. Why should ACT households pay up to \$1.53 plus a tax of 25 cents per kl when ACT water is being sent downstream free of charge to irrigators paying far less? It is curious environmental policy to turn a garden city into a desert so that rice can be grown downstream in a desert.²⁸ In a free market the law of one price would prevail. Only monopolists can sell the same product at different prices to different buyers.

Thus discriminatory block pricing violates Proposition C. It also violates Proposition B, as the scarcity value of water should enter as a uniform marginal cost.

5. *Using water utilities as cash cows*

When confronted with the new (and heretical) public finance fashion that all public services should be provided on the basis of “user pays”, most consumers, in their naiveté, assume that “user pays” means –

1. that they are charged the cost of what is supplied; and
2. that they will get what they have paid for.

The use of utilities as cash cows defeats even these humble expectations. What has been blessed (by either ignorance or wilful negligence or treasury subornation on the part of pricing regulators) is a form of replacement cost pricing for public works.

Once upon a time, dams were constructed and financed by the perfectly sensible system of land rates amortizing Water Board loans. Land developers often had to contribute infrastructure free of charge to the water authorities. It made, and still makes, economic sense for the fixed costs of network infrastructure to be charged against the land values being created or benefited. Then the flow of water through the system can be charged at its low marginal cost, ensuring optimal use.

Thus, suppose a town was built over 90 years and dams and water works and pipes were financed by levies on ratepayers. A normal person, and a genuinely rational economist, might think that these capital works had been paid for and therefore should not be charged for again.²⁹ Sadly that modest expectation is often defeated.

“Reform” has meant water users are being asked to pay again for costs already recovered or never borne by State Treasuries. To take just one example, the Queensland Government has sought to charge a rate of return on the Burdekin Dam which was paid for by the Federal taxpayer. As Professor Bob Walker noted some years ago, there are not many businesses where you can get your assets given to you by taxpayers or consumers and then turn around and demand a return on money you never had to outlay.

The conventional wisdom underlying the Council of Australian Governments and National Competition Policy water reforms is that:

(1) Water authorities in Australia were unprofitable and delivered a low return on the “investment” governments had made in them.

(2) Hence, they should be made to deliver a rate of return to their government “owners” equal to the rate of return on private sector equity investments.

Those assertions, constantly repeated, have assumed the status of urban legend, if not the status of self-evident truths.

Both these assertions need to be challenged.

Leaving aside whether water schemes were undertaken as “investments” or were created as public utilities for public benefit, as Walker and Walker (2000) and Walker (1993) have pointed out, public sector accounting for water authorities has often employed techniques which result in false or misleading figures showing low profitability when the reality is that water authorities have been more profitable than most listed industrial companies.

Walker and Walker (2000, p 87-88) point out that “many of those GTEs [government trading enterprises] were highly profitable by private sector standards, but had only *reported* low levels of profitability. This occurred because Australian GTEs were required to adopt radical methods of accounting – methods not used anywhere else in the world ... there are some important differences in the way private sector and public sector entities value their assets. It is not widely recognised that since the late 1980s, Australian GTEs have used a system of accounting which is radically different from that used in private sector accounting. This has produced radically different financial results.” (original emphasis). They go on to observe that “the major omission [of the Steering Committee *Guidelines on accounting policy for valuation of assets of Government Trading Enterprises*] was a failure to recognise that recent advocacy of the use of current replacement prices was that for consistency, the amounts by which asset values were increased should be brought to account in the operating statement as revenues (or unrealised gains). Adoption of this model of ‘clean surplus’ accounting would have meant that poor rates of return would have been converted into good rates of return. As it happened, the end result of the Working Party’s ill-informed activities was that Australian GTEs were told to adopt a system of accounting which produces figures for ‘profit’ and ‘rate of return’ which differ substantially from the figures which would be produced by private sector firms using private sector accounting methods. ... The Steering Committee had set out to ensure that the accounting methods used by GTEs would enable comparisons to be made between the government-owned businesses and ‘comparable’ private sector firms. They ended up promoting a system that ensured exactly the opposite”, see Walker and Walker (2000, p 97).

It was also forgotten that “A significant proportion of the assets of water authorities has been acquired through compulsory ‘donations’ from property developers. ... From an accounting perspective, the receipt of these ‘donations’ meant that water authorities had to record an increase in their assets - but most authorities recorded the receipt of these assets as an increase in ‘reserves’ rather than a source of revenues - the treatment indicated by the accounting profession’s statements of accounting concepts. Having recorded increases in assets, water authorities then wrote-off those assets through depreciation charges (which were treated as expenses, and hence reduced reported profits). The combination of these treatments meant

that the more donated assets received by those GTEs, the lower their reported profits.”, Walker and Walker (2000, pp 104-105).

The net result is that, after adjusting for revaluations and placing accounts on a common historic cost basis “water authorities were far more profitable than listed industrial companies.”, Walker and Walker (2000, p 106).

Yet, increasingly, a mantra of the need for “forward-looking” prices is invoked to justify charging consumers on the basis of what it would cost to replace these assets in their current state. “Depreciated optimized replacement cost” (DORC, to the initiates, and a name which justly reflects its lack of economic merit).³⁰

DORC may lack economic merit but it has wonderful features for infrastructure owners, such as State and Territory treasuries. One can blithely ignore the past history of who financed and contributed to public works and proceed to write up their value and claim a required rate of return on the capitalized value.³¹ To reap where he never sowed is the dream of every landlord, as Adam Smith observed. To charge for use of an asset you never paid for must rank alongside it as the dream of treasury officials and infrastructure monopolists.

As Professor Bob Walker noted, the effect of such artificial and contrived accounting is to enable water utilities to generate astounding cash surpluses on cash actually invested while showing apparently low rates of return (which are used to justify claims for ever-higher prices). The net effect is the State and Territory treasuries can look forward to higher “dividends” and pretend that this is “user pays” financing “reform” rather than the elaborate monopoly tax farming which it really is.³²

Worse still, unlike normal competitive industries, none of the new-found “profitability” of water authorities is leading to a rush of new investment in much-needed water storage infrastructure. Quite the contrary, State governments are trying to find reasons for forcing a massive and uneconomic duplication of water infrastructure, as each home has to fund its own mini-reservoir. (It may be socially more efficient to build a new dam and save the community the potential health and financial costs of millions of tanks but such high private costs are not borne by State Budgets.)

If none of the excess profits being gouged from water users are ever ploughed back into additional infrastructure, of course water prices must rise towards infinity. But this is the result of State government policy. It should not be blamed on a niggardly Creator.

In a free market, when prices rise they do more than merely ration existing supply – they call forth new supplies. What we are witnessing with water is a gross abuse of monopoly power – State governments are blocking new water supplies as thoroughly as a mediaeval warlord might cut off a besieged town’s water.

Scarcity pricing

Perhaps the most intuitively appealing argument for water restrictions has been the dogma that water is “scarce”.

But water is not necessarily scarce – contrast Cairns with Adelaide! Yet many economists

insist water has a scarcity value which must be paid. Fine then - where are the competitive markets to establish true scarcity prices? How else can one say water is necessarily scarce? Or is water supply being constrained by governments blocking the construction of long planned dams?³³ How can any professed economist talk about scarcity prices without examining the causes of scarcity? Does “scarcity” mean OPEC should charge \$100 or \$200 per barrel of oil? All prices reflect scarcity but are also held in check in a free market by the costs of new supply, so how can the reality of water supply issues be ignored?

If an import embargo were imposed on computers and power stations were banned, there would be rising scarcity prices for computers and electricity. But no serious economist would accept these were genuine scarcity rents. Rather, economists would denounce such distorting non-tariff quotas as redolent of a command economy. Studies would be done to quantify the economic costs of forcing business and households to use candles instead of light globes or the abacus instead of the computer. Economists would be advocating freeing up markets by allowing imports and new investment to improve efficiency, lower business costs and raise living standards, just as they rightly opposed tariffs.

One might pause to observe that this is like saying that office rental space in Sydney would be “scarce” if building codes vetoed any building over one storey high. The abundance of “water” as a delivered commodity depends, like office space, on supply as well as demand - as much on capital investment as natural availability of dam sites or aquifers. Office rents per sq metre can fall with new supply even as ground rents and land prices rise. If political correctness or environmental dogma says dams are an inherent evil and should not be built then, of course, delivered water will become “scarce” and rationed or expensive. But, in a free market, as the price of office space or delivered water rises, new buildings are erected or old ones refurbished and new water storages built or water recycled. Both new storage construction and recycling are natural economic responses to scarcity – neither is “right” or “wrong”: it all depends on the cost/benefit figures for each response in each case.

When it comes to explicit scarcity pricing for water, the ACT has, in fact, purported to impose such a “scarcity price”.³⁴ It is embedded in the “water abstraction charge” (WAC) on water taken from rivers or dam storages.

The WAC is composed of 3 elements, of which the latter two relate to “scarcity pricing”:

1. Alleged direct costs of catchment management;
2. Alleged opportunity costs of using water in the ACT;
3. Alleged costs of restoring diversions from the river system.

Alleged direct costs of catchment management

This is not part of a scarcity price but a pretended exercise in “full cost recovery”.

An examination of the ICRC’s papers and files on the water abstraction charge reveals that the basis of the ACT Government break-up of these alleged costs is not public. They are said to amount to 8.2 cents per kl.³⁵ But one is hard pressed to believe that ACT water users should really pay \$400,000 of ACT Treasury salaries as part of their water supply costs or \$200,000 to fund the Chief Minister’s Department.³⁶ Many of the other items claimed seem

equally dubious. For example, water users are charged for bushfire prevention, a general public service. Some expenses seem more a cost of national park management for the general public benefit than costs of water supply. Given the lack of transparent charging it is difficult to test this component of the WAC but it seems more like a general revenue tax imposed on water users than a bona fide charge for services rendered.

Alleged opportunity costs of using water in the ACT

A further charge is levied on the basis that ACT water has a 4.4 cents per kl scarcity value downstream.³⁷ This reasoning purports to justify a scarcity price but, in reality, is an abuse of the concept of opportunity cost.

Users downstream have to pay for water rights they do not already own. The ACT already has rights over its own water. It is not normal in economics to pay for what you already own.

More importantly, the ACT Government suffers no opportunity cost as over 96% of ACT water is sent downstream to irrigators *at no charge*.³⁸

Further, even if water were sold downstream, one notes that ACT water users pay up to \$1.53 per kl. To claim an opportunity cost of 4 cents when you are willingly forgoing \$1.53 is like saying one should get a \$1.57 for a chocolate bar from a customer already paying \$1.53 because there is a hypothetical customer willing to pay 4 cents (but to whom you are giving the chocolate free of charge in any case). In truth, the concept of opportunity cost is being misapplied. If I sell a Mars bar to X for \$1.53 when Y will pay me 4 cents for it, I cannot say X should pay me another 4 cents because that is the “scarcity value” of the Mars bar. X will rightly retort that he is happy to pay only 4 cents for the Mars bar instead of \$1.53.

This element of the charge is therefore an economic irrationality and no true cost of a service. It offends rational water pricing principles which are supposed to ensure water is allocated to those willing to pay the most for it. Urban users paying up to \$1.53 are obviously paying more than irrigators at 4.4 cents per kl.

As for the Murray-Darling basin itself why should ACT water users pay a tax of 25 cents per kl on top of up to \$1.53 per kl when other users in the same basin sometimes pay almost zero, as low as 0.3 cents per kl in one case?

Economic efficiency requires any scarcity price be charged equally for all users and across all levels of use. That does not happen.

Indeed, using the concept of opportunity cost correctly means that this supposed flow cost is negative. Water can be sold in the ACT for marginal revenue of \$1.53 but is being sent free down the river to be used by people who only value it at 4.4 cents per kilolitre. If we apply the logic of opportunity cost correctly, the true opportunity cost is a *negative \$1.486 per kilolitre*.

Alleged costs of restoring diversions from the river system

A further 5.1 cents per kl is charged as part of the alleged cost of restoring flow to the river system, an additional so-called environmental cost.³⁹

The is justified in a strange statement by ICRC that “Because the cost of purchasing water entitlements to augment river flows is a capital cost associated with a permanent improvement in flows, calculating the environmental cost component of the WAC involves calculating a return on this capital cost.”⁴⁰

The statement seems to mean the owner of a natural resource should pay to put it *all back on principle*, even where he is quite satisfied that he has done enough to preserve the environmental flows⁴¹ and even where *any* use necessarily means some water will not go back to the environment in the same way, as part of a river (though no water is ever really lost to the ecosystem and the ACT already returns most of its used water back to the river).

If one is charged (whether 4.4 cents or \$1.53) under the previous heading to take water, why should one be charged again? On its own “logic”, one has already paid for a diversion of water allocation away from irrigators to urban users. There is no *net* reduction in river flow.

This so-called “environmental cost” is like saying someone who has built a house on a block in a new development should be charged again for the cost of restoring an equal amount of land back to native bushland. If someone sells you a widget at the going market price, it is his business if he wishes to replace his widget stocks, not yours. You do not pay for two widgets. With the 4.4 cents in the previous element of the WAC, the ACT Government could buy back allocation for the river, if it so desires. (One also notes that much of the water flows back in the fullness of time into the river in any case, whether by drainage or evaporation and rainfall in some other part of the basin.)

Further, the urban water users of ACT are given no credit for the environmental flows from the dams which ACT water users have paid for - they are being more than double charged, once it is realised that they have paid for the dams which sustain the environmental flows.

But is urban water necessarily scarce?

While one must agree that water is scarce for irrigators drawing water from over-allocated rivers in the Murray-Darling Basin, it does not follow that water is scarce everywhere. Coastal cities storing water which would otherwise flow unused into the sea might question what is meant by scarcity.

Taking the example of the ACT, the most basic criticism of the WAC is that water is not scarce in the ACT. The ACT water utility, ACTEW, states that the ACT has enough water for a million people, *after meeting environmental requirements*, and is only using (after recycling) about one-sixth of the amount of water available for human use. ACTEW states that some 94% of ACT water goes downstream free of charge to New South Wales which sells much of it for irrigation use. Even after allowing for mandated “environmental flows” (which claim over half of the ACT’s water) the ACT uses gross only one-third of the water available for human use.⁴²

In relation to the water abstraction “costs” question, we must conclude that *at most* an apportioned fraction of 8.2 cents of real, actual, cash outlays per kilolitre might be perhaps be justifiable. The scarcity and environments “costs” are based on illegitimate and spurious reasoning to create additional notional “costs”.

In relation to the “value of water” question, we note that ACT water users would be delighted to pay 4.4 cents per kilolitre as the “scarcity value” for any amount of extra water (given that they have already borne all ACTEW storage and reticulation costs). 4.4 cents is a lot less than \$1.78!⁴³

Conclusion

There is no economic justification for spurious water pricing “reforms” which strip excess profits from urban users, block increased supply, discriminate arbitrarily and push up business and living costs in the process.

I therefore contend that urban water pricing is not being determined by genuine economics. It is a form of thinly-disguised excise taxation⁴⁴ enforced by a blockade of new supplies. The blockade of new water storages and the re-allocation of existing water storages to environmental flows lack any genuine cost-benefit justification. Urban water pricing reflects abuse of monopoly power and lucrative monopoly rents, rather than true resource scarcity rents. It is as trivially beside the point to say that urban water pricing should reflect scarcity as to say the price of bread in Berlin in 1918 reflected scarcity rather than the Allied blockade.

The real hidden issues in the new urban water “political correctness” are the blockade of new supply and arbitrary rationing of existing supply. Those willing to defend this situation are at odds with orthodox economics. While one can understand the revenue desires of treasuries, the self-interest of would-be private water infrastructure owners, the ideology of environmental Puritanism and the love of politicians for redistributing income, none of these amount to a valid *economic* consideration in pricing urban water. Urban water supply and prices should not be set by an Australian “water OPEC” of State governments filling their coffers and acting like the monopolists justly despised by Adam Smith when he wrote “The monopolists, by keeping the market constantly under-stocked, by never fully supplying the effectual demand, sell their commodities much above the natural price, and raise their emoluments, whether they consist in wages or profit, greatly above their natural rate.”⁴⁵ For economists to join, wittingly or unwittingly, in the defence of monopoly pricing of urban water is to surrender their profession to a neo-mercantilist identification of profit with public benefit.

REFERENCES

- ACT Government. 2003. *Think water, act water: Vol 1 Draft strategy for sustainable water management in the ACT*. Canberra: Environment ACT.
- ACT Government. 2004. *Think water, act water: Vol 1 Strategy for sustainable water management in the ACT*. Canberra: Environment ACT.
- ACTEW Corporation. 2004a. *An Assessment of the Need to Increase the ACT's Water Storage*. Canberra: ACTEW Corporation.
- ACTEW Corporation. 2004b. *Options for the next ACT water source*. Canberra: ACTEW Corporation.
- ACTEW Corporation. 2005a. "Future Water Options for the ACT Region - Implementation Plan: A recommended strategy to increase the ACT's water supply."
- ACTEW Corporation. 2005b. *Future Water Options for the ACT Region - Implementation Plan: A summary of the recommended strategy to increase the ACT's water supply*. Canberra: ACTEW Corporation.

Berg, Sanford V. 1998. "The basics of rate design - pricing principles and self selecting two-part tariffs," in *Infrastructure regulation and market reform: Principles and practice Selected papers prepared for the Utility Regulation Training Program held in November 1997 in Melbourne by the Australian Competition and Consumer Commission and the Public Utility Research Centre, University of Florida, May 1998.* (ACCC) Australian Competition and Consumer Commission ed, pp. 74-90.

Centre for International Economics. 2005. *Economic benefit-cost analysis of new water supply options for the ACT.* Canberra: ACTEW Corporation.

Coase, R H. 1946. "The Marginal Cost Controversy." *Economica (NS)*, 13, pp. 169-82.

Engineers Australia. 2004. *Engineers debunk the water myths.* Canberra: Engineers Australia.

Hotelling, Harold. 1938. "The general welfare in relation to problems of taxation and of railway and utility rates." *Econometrica*, 6, pp. 242-69.

Independent Competition and Regulatory Commission. 2003a. *Draft report - Water abstraction charge.* Canberra: ICRC.

Independent Competition and Regulatory Commission. 2003b. *Final Report: Water Abstraction Charge.* Canberra: ICRC.

Independent Competition and Regulatory Commission. 2003c. *Issues paper - Water abstraction charge.* Canberra: ICRC.

Independent Competition and Regulatory Commission. 2005. *Media statement: Regulator approves new ACT water price increases.* Canberra: ICRC.

Industry Commission. 1992. *Water Resources and Waste Water Disposal, Report No. 26.* Canberra: AGPS.

Industry Commission. 1993. *Annual Report 1992-93.* Canberra.

Johnstone, David and M J R Gaffkin. 1996. "Review of the Asset Valuation Guidelines of the Steering Committee on the National performance Monitoring of GTEs." *Australian Accounting Review*, 6:1, pp. 50-65.

Johnstone, David and Murray Wells. 1998. *Utility asset valuation and the problem with DORC:* unpublished paper.

King, Stephen. 1996. "Asset Valuation and Access to Essential Facilities under Part IIIA of the Trade Practices Act 1974 (Cth)," in *Deregulation of Public Utilities: Current Issues and Perspectives.* Megan Richardson ed. Melbourne: Centre for Corporate Law and Securities Regulation, Faculty of Law, University of Melbourne, pp. 94-116.

Larkin, J T and T M Dwyer. 1995. *Refocusing Microeconomic Reform.* Melbourne: Business Council of Australia.

McIntyre, Ross A, Reginald F Goldfinch, Kenneth Johnson, and F Charles Speldewinde. 2003. *Augmentation of water supply to the ACT and region: Report for Engineers Australia.* Canberra: unpublished.

Smith, Adam. 1776-1784. *An Inquiry into the Nature and Causes of the Wealth of Nations.*

Vickrey, William. 1948. "Some Objections to Marginal-Cost Pricing." *Journal of Political Economy*, 56, pp. 218-38.

Vickrey, William. 1977. "The City as a Firm," in *The Economics of Public Services: Proceedings of a Conference held by the International Economic Association at Turin.* M S Feldstein and R P Inman eds. London: Macmillan, pp. 334-43.

Vickrey, William. 1987. "Marginal- and Average- Cost Pricing," in *The New Palgrave.* Eatwell and et al eds: Macmillan, pp. 311-18.

von Böhm-Bawerk, E. 1894-95. "The Positive Theory of Capital and Its Critics: Part I." *Quarterly Journal of Economics*, 9, pp. 113-31.

von Böhm-Bawerk, E. 1907-08. "The Nature of Capital: A Rejoinder." *Quarterly Journal of Economics*, 22, pp. 28-47.

Walker, Bob and Betty Con Walker. 2000. *Privatisation: Sell off or sell out? - The Australian experience*. Sydney: ABC Books.

Walker, R G. 1993. "Evaluating the Financial Performance of Australian Water Authorities," in *Water in Australia: Managing Economic, Environmental and Community Reform*. Michael Johnson and Stephen Rix eds. Sydney: Pluto Press and University of New South Wales.

Watson, Alistair. 2005. "Competition and Water: A Curmudgeon's View." *'Relationship Between Essential Facilities and Downstream Markets' Conference organised by the Australian Competition and Consumer Commission: Gold Coast, Queensland*.

ENDNOTES

¹ Since commencing to raise queries about these issues in the correspondence pages of the *Australian Financial Review* and the *Canberra Times*, I have been pleased to discover I am not alone. Watson, Alistair. 2005. "Competition and Water: A Curmudgeon's View." *'Relationship Between Essential Facilities and Downstream Markets' Conference organised by the Australian Competition and Consumer Commission: Gold Coast, Queensland.*, has expressed parallel concerns over the abandonment of economic logic when it comes to pricing and supplying water.

² The classic example is that no one should be charged to cross an uncrowded bridge where his use does not cause any wear and tear. There is no marginal social cost to his use and forcing him to walk around another way may waste hours of his time and money.

³ Which is why the fixed costs of bridges are often covered by rates on the lands benefited (as was the Sydney Harbour Bridge in part). If the then NSW Government had sought to cover the whole cost of the Bridge by tolls, no one could have afforded to use it and the Bridge would have been a white elephant. Lump sum rates and zero marginal cost pricing avoid such instances of "cutting off the nose to spite the face".

⁴ For example, if it costs \$2 to import a widget but I am given an exclusive license to import such widgets, I can charge what the market will bear, which may mean a price of \$10 to the consumer. The excess is no part of the cost of supply but a monopoly rent enjoyed by me.

⁵ The capitalized market value of my exclusive widget import licence may be \$50 million but to call that value "capital" as if it were a factor of production is a gross misnomer. It is the value of a licence to tax. "J. B. Clark's concept of 'true capital' leads to aberrations far more subtle and deceptive and for that very reason far more dangerous." E. von Bohm-Bawerk, *Capital and Interest*, Volume II, "Positive Theory of Capital," I, iii, p. 55. See also *ibid.*, I, iii, pp. 56-62 and von Böhm-Bawerk, E. 1894-95. "The Positive Theory of Capital and Its Critics: Part I." *Quarterly Journal of Economics*, 9, pp. 113-31. at pp. 121-122, 129; also von Böhm-Bawerk, E. 1907-08. "The Nature of Capital: A Rejoinder." *Quarterly Journal of Economics*, 22, pp. 28-47., at p. 30.

⁶ For example, the privatized salt-taxing monopolies let out to tax farmers under the *ancien regime* in pre-1789 France were very profitable but their economic costs to the community as a whole were very high. In competitive industries profitability is a sign of efficiency in meeting consumers' wants (who are free to shop elsewhere). With a monopoly, where no such consumer choice exists, high profits resemble an exaction of tribute more than a justified return for any real service (which rather helps explain why the French populace revolted against their political masters). This is an obvious point but it needs to be made because official reports in Australia by the Industry and Productivity Commissions on the financial performance of government trading enterprises seem oblivious to it. Such ignorance is not universal - "Of course water authorities make high profits. They are monopolies. High profits by monopolies are not necessarily an indicator of efficiency." EPAC economist, quoted in Walker, Bob and Betty Con Walker. 2000. *Privatisation: Sell off or sell out? - The Australian experience*. Sydney: ABC Books., at p 109).

⁷ An overview of these issues from a practical perspective may be found in Larkin, J T and T M Dwyer. 1995. *Refocusing Microeconomic Reform*. Melbourne: Business Council of Australia. To take an example, if the Federal Government imposed a 900% tax on the supply of a kilolitre more water (which cost 20 cents to deliver) it would have the same damaging economic effects as a State water authority charging \$2.00 a kilolitre. Calling something a “price” as opposed to a “tax” does not mean it becomes an economically justified cost of supply – the tax is simply disguised. (However, there is a presentational or “spin doctoring” advantage for governments. A “price” does not get counted in national or international statistics of tax burdens.)

⁸ Hotelling, Harold. 1938. "The general welfare in relation to problems of taxation and of railway and utility rates." *Econometrica*, 6, pp. 242-69.

⁹ On marginal cost pricing and answers to objections, see Coase, R H. 1946. "The Marginal Cost Controversy." *Economica (NS)*, 13, pp. 169-82, Vickrey, William. 1948. "Some Objections to Marginal-Cost Pricing." *Journal of Political Economy*, 56, pp. 218-38, Vickrey, William. 1987. "Marginal- and Average- Cost Pricing," in *The New Palgrave*. Eatwell and et al eds: Macmillan, pp. 311-18.

¹⁰ ACT Government. 2003. *Think water, act water: Vol 1 Draft strategy for sustainable water management in the ACT*. Canberra: Environment ACT, Hotelling, Harold. 1938. "The general welfare in relation to problems of taxation and of railway and utility rates." *Econometrica*, 6, pp. 242-69.

¹¹ This theme has been developed into the George-Hotelling-Vickrey Theorem which states that external benefits capitalized in land values can exactly cover the fixed costs of economically justified infrastructure, see Vickrey, William. 1977. "The City as a Firm," in *The Economics of Public Services: Proceedings of a Conference held by the International Economic Association at Turin*. M S Feldstein and R P Inman eds. London: Macmillan, pp. 334-43. Australia was ahead of modern economic theory yet seems now to have forgotten the reasoning behind the rating system.

¹² Note that if all land resources are held on market based rents from the Crown, a form of compensation naturally occurs – those whose lands are increased in value thanks to water infrastructure pay more, those whose lands or fishing rights decline in value pay less. The external gains and losses are internalized in net land values and net Crown revenues.

¹³ Readers of Evelyn Waugh’s *Sword of Honour* trilogy will doubtless regret that his pen is not documenting a new era of “incorrect opinions”.

¹⁴ The ACT and Queanbeyan population of 370,000 uses a gross 65 gigalitres (GL) per annum out of 494 GL of ACT controlled water resources of which 269 GL are dedicated to “environment flows”. ACTEW Corporation. 2005a. "Future Water Options for the ACT Region - Implementation Plan: A recommended strategy to increase the ACT's water supply.", at p 1. 35 GL is treated as sewage and returned to the river system, leaving an apparent net usage of 30 GL a year. ACT Government. 2003. *Think water, act water: Vol 1 Draft strategy for sustainable water management in the ACT*. Canberra: Environment ACT. pp 13, 16. However, even this net usage is necessarily overstated as it takes no account of water returning to the rivers from houses, parks and gardens outside the sewer system (which is increased by urban run-off) – “In Canberra’s case, urban areas are thought to produce on average about 13 GL more runoff than the previous largely rural environment – a significant impact.” ACT Government. 2003. *Think water, act water: Vol 1 Draft strategy for sustainable water management in the ACT*. Canberra: Environment ACT. p 16. So the net human usage is at most 17 GL out of 494 GL or 3.4% (which still does not account for returns by way of evaporation and precipitation within the river basin).

¹⁵ Up to 41 GL a year is let out of ACT dams for “environmental flows” (compared to the net usage of 17 GL by the human population). ACT Government. 2003. *Think water, act water: Vol 1 Draft strategy for sustainable water management in the ACT*. Canberra: Environment ACT. P 24. One can only speculate that the protected fish must be worth more than their weight in gold or diamonds.

¹⁶ ACT Government. 2004. *Think water, act water: Vol 1 Strategy for sustainable water management in the ACT*. Canberra: Environment ACT., at p 43. These are flows let out of the dams.

¹⁷ It ought also be noted that if the Cotter dam had not been built in 1915, the protected fish species would long ago have been eliminated by viruses passing upstream. The actions of human water users in building a dam saved the fish from extinction by building a quarantine barrier.

¹⁸ The *Canberra Times* (24 September 2005, Diana Streak, *Fears it will be a bare old bush capital*) reports that 8,000 public trees out of 625,125 may have been killed by drought. Assuming a similar number killed on private land, it is likely that at least 16,000 trees were lost due to lack of water. To take a “back of the envelope” computation, if it costs \$1,000 to chop down a dead tree and dig out its roots for replanting and if a new tree costs \$100 and takes 30 years to grow, then the replacement cost of a tree at a 7% interest rate is \$1,100 compounded over 30 years, that is, \$8,373.48. If 16,000 trees die due to water restrictions then this one cost alone of water restrictions is 16,000 times \$8,373.48, that is, a cost to the community of \$133,975,688.75 during just one period of water restrictions. This cost ignores the cost of trimming damaged and dangerous trees and is apart from many other costs (time spent holding hoses, health impacts, cleaning dust etc). Such other costs may be even more significant. For example, ACT average weekly ordinary time earnings were \$1,160.70 in May 2005, giving an hourly labour value of \$30.54. If 80,000 ACT householders have to spend an average of 3 hours extra per week holding hoses through 16 weeks of water restrictions, that comes to a *corvée* (compulsory unpaid labour required by a ruler) of 3,840,000 hours annually. The total time cost of just one year of such water restrictions is then \$117,291,789.47. Thus just the dead tree and time costs of water restrictions *in one year alone* could be in excess of \$200 million.

¹⁹ *Canberra Times*, Wednesday, 29 April 2005 p 1. In particular, Stage 3 restrictions were estimated to cost \$60 million a year. ACTEW Corporation. 2005b. *Future Water Options for the ACT Region - Implementation Plan: A summary of the recommended strategy to increase the ACT's water supply*. Canberra: ACTEW Corporation., at p 2. See also ACTEW Corporation. 2005a. "Future Water Options for the ACT Region - Implementation Plan: A recommended strategy to increase the ACT's water supply.", pp 8-10. These estimates come from Centre for International Economics. 2005. *Economic benefit-cost analysis of new water supply options for the ACT*. Canberra: ACTEW Corporation. They almost certainly understate the losses. It should be noted that the CIE used a “willingness to pay” demand estimation methodology to estimate household losses instead of a direct computation of labour costs (as it did with recreational losses) and did not count damage to household trees or gardens. The “willingness to pay” method does not seem to have been applied to the baseline further planned *per capita* reductions of 12 or 25% (of which people are probably quite unaware, p 36). Historical data may also be irrelevant to estimating demand now. As *per capita* demand has fallen by 20% since 1992, a further reduction of 25% (down to 60% of 1992 per capita consumption) means that any demand point elasticity based on data from those days is likely to seriously underestimate welfare losses. Further, any “willingness to pay” method based on survey data may also be inherently biased downwards. Apart from obvious problems of sample bias, some people may feel guilty in confessing that they want to “pay” for an environmental good while others may think water is “priceless” and not to be sold. Others again may refuse to say they will pay, not because they are happy with water restrictions, but because they are angry about the failure of government to supply an essential of a civilized society and would prefer to vote out governments which so fail. They may think “why offer to pay when you can vote to get the essential public services your taxes are supposed to pay for?”.

²⁰ ACTEW Corporation. 2005a. "Future Water Options for the ACT Region - Implementation Plan: A recommended strategy to increase the ACT's water supply.", at p5 notes that ACTEW's water supply strategy assumes implementation of Government-directed *per capita* water use reductions of 12% by 2013 and 25% by 2023 (which will cost \$323 million to implement).

²¹ ACT Government. 2003. *Think water, act water: Vol 1 Draft strategy for sustainable water management in the ACT*. Canberra: Environment ACT., at p 15. The changes are detailed in Centre for International Economics. 2005. *Economic benefit-cost analysis of new water supply options for the ACT*. Canberra: ACTEW Corporation., at p 15. "Prior to 1991-92, households were provided with a free allowance of 455 kl and charged for consumption above this amount (the excess charge). Reforms commenced in 1991-92 with a reduction in the free allowance to 350 kl. In 1994-95 the free allowance was reduced to 1 kl per annum and a two-part inclining block tariff was introduced, with usage up to 350 kl being charged 28c per kl, increasing to 64c per kl for consumption above 350 kl. Graham and Scott (1997) report that in the five years following the introduction of reforms, a significant proportion of households reduced their annual water consumption to below what was previously the free allowance. Most of this behavioural change occurred among middle-class households in older, more established suburbs. On average this cohort of households reduced their annual consumption from 350kl to 300kl. And this reduction was observed during a period that was free of water restrictions."

²² ACTEW Corporation. 2005a. "Future Water Options for the ACT Region - Implementation Plan: A recommended strategy to increase the ACT's water supply.", at p 5.

²³ Ibid. at page 34. The Tennent Dam options range from \$185 million (a small 43 GL dam), through \$204 million (a medium 76 GL) to \$250 million for the large 159 GL dam. \$12 million can be subtracted from each option if water flows to the existing Stromlo treatment plant. Thus the maximum cost is \$238 million. (The figures do also demonstrate the usual economies of "buying in bulk".) In ACTEW Corporation. 2004b. *Options for the next ACT water source*. Canberra: ACTEW Corporation., at p 15, capital costs for a 152 GL Tennent dam were put at \$131 million, not \$250 million. As the project can be staged, the present value of the dam cost would be less.

²⁴ It does not take much effort to see that storing water in bulk is cheaper than many small dams or tanks. This is demonstrated in ACTEW Corporation. 2004a. *An Assessment of the Need to Increase the ACT's Water Storage*. Canberra: ACTEW Corporation. At p 10, the graph in Figure 3-2 shows even the most expensive dam option is cheaper than rainwater tank rebates (and the graph only seems to count the government, not private, cost of such an option!).

²⁵ Independent Competition and Regulatory Commission. 2005. *Media statement: Regulator approves new ACT water price increases*. Canberra: ICRC. (It would have been newsworthy had the Commission rejected the price increases.)

²⁶ On basic Ramsey pricing as applied to utilities, see, for example, Berg, Sanford V. 1998. "The basics of rate design - pricing principles and self selecting two-part tariffs," in *Infrastructure regulation and market reform: Principles and practice Selected papers prepared for the Utility Regulation Training Program held in November 1997 in Melbourne by the Australian Competition and Consumer Commission and the Public Utility Research Centre, University of Florida, May 1998*. (ACCC) Australian Competition and Consumer Commission ed, pp. 74-90. The basic idea of Ramsey pricing is to get extra usage charged as close to low optimal marginal cost as possible while covering your fixed costs by "soaking" the user on his first block of usage or for the privilege of connecting up to become a user. (But unless the "connection" or "access" charge is a rate on land serviced, there will still be a balancing of distorting effects.)

²⁷ For example, in a larger household, the one dishwasher or washing machine may serve more people for the same amount of water. Six gardens for 6 homes, each occupied by one person, may use more water than one garden enjoyed by a family of six. In targeting families as "large users"

deserving of price punishment the ACT regulator (ICRC) has ignored potentially *lower per capita* use. This appears to be confirmed by a recent study for the Water Services Association which shows single person households use more water *per capita*. In Melbourne, a single person indoors consumes an average 220 litres daily, a second person in the household 176 litres and the third and subsequent persons 110 litres each. (*The Australian*, 26 September 2005, Asa Wahlquist, *Single-living blows out water use*). One might also note that government policies granting age pensioner rebates for water charges and exempting family homes from the social security assets test have an effect contrary to the alleged imperative of reducing urban water use.

²⁸ It is interesting to note that Queensland Murray-Darling river extraction charges for cotton irrigators are set at \$3 per megalitre, that is, 0.3 cents per kilolitre.

²⁹ The point is that much water infrastructure (dams, treatment plants, pipes) has already been paid for by consumers, either through rates on their land, the fixed charge component of their water bills, or in the price they paid for serviced land. Marginal cost pricing dictates that no attempt should be to recover such sunk costs. If these capital costs have already been amortized, there is not even a financial reason to seek to cover fixed costs. Romans do not charge Italians for ancient aqueducts. As Hotelling remarked, the dead should be left to bury the dead and prices should not be set today to recover a return on dead investments. (In the case of a firm in a competitive market, competition will enforce non-recovery of amortized costs, but government-controlled natural monopolies are different. Whereas private firms stump up their own money to build their factories, water boards forced users to pay either upfront or by amortizing public works loans. Many water boards resembled compulsory user co-operatives but have been now seized by State treasuries to serve as “corporatized” cash cows.)

³⁰ For other critiques of DORC, see Johnstone, David and M J R Gaffkin. 1996. "Review of the Asset Valuation Guidelines of the Steering Committee on the National performance Monitoring of GTEs." *Australian Accounting Review*, 6:1, pp. 50-65, Johnstone, David and Murray Wells. 1998. *Utility asset valuation and the problem with DORC*: unpublished paper, King, Stephen. 1996. "Asset Valuation and Access to Essential Facilities under Part IIIA of the Trade Practices Act 1974 (Cth)," in *Deregulation of Public Utilities: Current Issues and Perspectives*. Megan Richardson ed. Melbourne: Centre for Corporate Law and Securities Regulation, Faculty of Law, University of Melbourne, pp. 94-116.

³¹ It is often stated as a fact that water users have been subsidized by taxpayers. This statement may be true in the case of some rural schemes (though by no means always) but it is not generally correct for urban water users. It ignores financing from land sales, land rating, compulsory developer infrastructure and amortized loans paid off from water authority revenues. This subsidy “factoid” (a asserted fact manufactured for the furtherance of policy purposes) rests on the flawed work of the Industry Commission and others so skilfully dissected by Professor Bob Walker.

³² Many commentators on water pricing would benefit from reading both Walker, Bob and Betty Con Walker. 2000. *Privatisation: Sell off or sell out? - The Australian experience*. Sydney: ABC Books, Walker, R G. 1993. "Evaluating the Financial Performance of Australian Water Authorities," in *Water in Australia: Managing Economic, Environmental and Community Reform*. Michael Johnson and Stephen Rix eds. Sydney: Pluto Press and University of New South Wales.

³³ Or by governments emptying dams to satisfy “environmental flows”. It has been stated that “in the 41 month period since the ACT water storages were last full to May 2004, over 109 GL was released from storages to satisfy environmental flow requirements. This is one half of the total storage capacity of Googong, Corin, Bendora and Cotter Dams and explains the current low (below 50%) level of the water reserves... *environment flow releases have exceeded the net ACT water use.... that release is largely responsible for the current restrictions.*” (emphasis added) Engineers Australia. 2004. *Engineers debunk the water myths*. Canberra: Engineers Australia. For an overview of the interaction between environmental flows and supply needs in the ACT, see McIntyre, Ross A, Reginald F

Goldfinch, Kenneth Johnson, and F Charles Speldewinde. 2003. *Augmentation of water supply to the ACT and region: Report for Engineers Australia*. Canberra: unpublished.

³⁴ See Independent Competition and Regulatory Commission. 2003a. *Draft report - Water abstraction charge*. Canberra: ICRC, Independent Competition and Regulatory Commission. 2003b. *Final Report: Water Abstraction Charge*. Canberra: ICRC, Independent Competition and Regulatory Commission. 2003c. *Issues paper - Water abstraction charge*. Canberra: ICRC. Figures are taken from the final report.

³⁵ Independent Competition and Regulatory Commission. 2003b. *Final Report: Water Abstraction Charge*. Canberra: ICRC., p 14.

³⁶ *Ibid.*, p 12.

³⁷ *Ibid.*, pp 13-14.

³⁸ As noted earlier, on the official figures the ACT has some 222 GL available for human use, even after allowing for mandated “environmental flows.” Human usage is 65 GL (gross) and 17 GL (net).

³⁹ Independent Competition and Regulatory Commission. 2003b. *Final Report: Water Abstraction Charge*. Canberra: ICRC., p 14.

⁴⁰ *Ibid.* p13. It seems to be analogous to saying that some who hires the use of a taxi should also pay for a return on its capital cost – which is what the hire price covers anyway!

⁴¹ As noted above the ACT has a substantial surplus of water over and above mandated environmental flows.

⁴² ACTEW Corporation. 2004a. *An Assessment of the Need to Increase the ACT's Water Storage*. Canberra: ACTEW Corporation., p iii. As noted above ACTEW's figures are conservative, in that net human usage is around 17 GL not 65 GL.

⁴³ \$1.53 per kl plus the WAC (water abstraction charge) of 25 cents.

⁴⁴ Sometimes it is actually conceded that utility charges are just another form of taxation, but it is then argued that, although all taxation is bad, taxes levied via monopolies on inelastic demands for necessities are less bad than other taxes and if a government cashes in on windfall monopoly profits, that does not have any efficiency implications. If it is just taxing a monopoly rent, the government *could* forego it for the benefit of water consumers. But then, for a given level of spending, it would need to raise revenue somewhere else. And that would be more distortionary than water charges which are spread through the community like poll taxes. For example, the Industry Commission agreed with the standard academic argument that prices in excess of short run marginal cost (SRMC) are taxes but sought to justify prices above SRMC on the basis that funding access deficits have to be made up by one tax or another so the users may as well be taxed. It argued that “imposition of a financial target offers an alternative to sustained losses by requiring the enterprise to price above long-run marginal cost and recover full costs including a return on capital. A financial target in this sense is simply another form of indirect taxation. The choice is essentially between taxation methods. The inefficiency involved in raising a toll above marginal cost to reduce enterprise losses must be weighed against the inefficiencies incurred elsewhere in the economy by distortionary taxes levied to finance the losses of [government business enterprises.]” (Industry Commission. 1993. *Annual Report 1992-93*. Canberra., p 180).

The argument fails. First, the variable per kl charge is not a tax on monopoly rent but operates as a non-uniform excise tax. Second, the argument is only true of the lump sum access charge if that fixed charge is a rate on unimproved land values. By contrast, large fixed connection charges on users

could drive some large water using industries offshore, whereas land rates are capitalized in lower land values and do not affect net production costs (a crucial point overlooked in Industry Commission. 1992. *Water Resources and Waste Water Disposal, Report No. 26*. Canberra: AGPS.)

⁴⁵ Smith, Adam. 1776-1784. *An Inquiry into the Nature and Causes of the Wealth of Nations.*, Vol I, Bk I, Ch vii, p 78. Perhaps both Adam Smith and Böhm-Bawerk would be scandalized by the spectacle of economists producing reports to justify monopoly pricing.