



BHP Petroleum

12 February, 2001

The National Access Regime Inquiry
Productivity Commission
PO Box 80
BELCONNEN ACT 2616

Dear Sir/Madam,

**SUBMISSION TO PRODUCTIVITY COMMISSION - INQUIRY INTO THE
NATIONAL ACCESS REGIME**

BHP Petroleum is pleased to be able to make a submission to the Productivity Commission review of Clause 6 of the Competition Principles Agreement and Part IIIA of the Trade Practices Act. Attached to this submission is a paper prepared for BHP Petroleum by Bob Lim and Co Pty Ltd. This paper addresses in more detail some of the issues we raise in our submission.

The National Access Regime has been beneficial to the Australian economy. It has improved the international competitiveness of our industry and enhanced consumer welfare.

Energy is a key input into the economy. Regulated access to monopoly infrastructure within the energy sector (transmission and distribution infrastructure) via industry specific Codes has resulted in substantial price reductions. Price reductions have been made possible via the removal of some of the monopoly rent that the previous structure of unregulated natural monopolies, vertically integrated supply chains and exclusive retail franchises allowed to exist.

Effective access regulation for the monopoly segments of the energy chain must be maintained and strengthened.

Scope of Access

Access under Part IIIA should be confined to natural or legislated monopolies. Within the energy sector of the economy these are the key gas and electricity transmission and distribution networks. Access regimes such as those provided for under Part IIIA are not necessary for upstream or downstream production facilities as these are not natural monopolies.

The West Australian gas market best demonstrates the fact that upstream production facilities are not natural monopolies while transmission pipelines and distribution systems are. There are eight separate production joint ventures spread over two production basins supplying gas into the WA market. These Joint Ventures range in size from the massive NWS project that sells hundreds of terajoules per day into the market to the small Woodada field that sells a few terajoules a day. No dominant economy of scale is therefore apparent. However, each

production basin only has one transmission pipeline linking it with the major market in the south west of the state. Similarly the transmission system only connects with one distribution system.

Asset Valuation / Monopoly Rent

Within the energy transmission and distribution sector, Depreciated Actual Cost (DAC) is the most appropriate asset valuation methodology. DAC is fair to both the asset owner and users. In other sectors of the economy, such as telecommunications, other asset valuation methodologies may be more appropriate.

Unfortunately, the regulators of gas and electricity access have allowed asset values for regulatory purposes to be set well in excess of DAC. BHP estimates that the regulatory asset value of monopoly gas infrastructure in Australia is \$8.5 billion. This is some \$3.5 billion above the DAC of the assets. This \$3.5 billion translates into an additional annual cost to consumers of some \$325 million. This additional cost is only possible due to the monopoly nature of the asset and is a monopoly rent.

Regulatory asset revaluations have sought to legitimise some of the monopoly rents previously extracted by firms with exclusive transmission and distribution franchises.

Pricing Principles

The National Access Regime should include a set of simple and clear pricing principles that regulators are obliged to follow. They include:

1. Pricing to reflect efficient costs.
 - The target rate of return should be based on a weighted average cost of capital that reflects how an efficient asset owner would finance the infrastructure.
 - The initial regulatory asset base should be set at an appropriate level. Within the energy transmission and distribution sector this should be depreciated actual cost.
 - The regulatory asset base should only be depreciated once. Depreciation should be based on economic life.
 - Allowable operating costs should be only those costs that an efficient and best practice operator would incur.
2. Prices should be determined on a fully distributed cost basis.
3. All users must be subject to the same price for the same service.
4. Users should only have to pay a price that reflects the costs of the assets they actually use.

5. Any form of impost to fund a community service obligation must be completely transparent.

Asset Owners Obligations to Collect, Maintain and Disclose Information

Perhaps the biggest process issue under the gas and electricity access Codes has been the disclosure of information by the asset owner to the regulator and users. Asset owners have resisted providing the regulator and users with the information they need to properly assess the asset owners access proposal. Months have been wasted while the regulator pursues additional information from the asset owner.

Asset owners should be obliged to maintain regulatory accounts that are available to the regulator and users. These accounts should be standardised, audited and consistent. This is essential to address the information asymmetry problem that exists with regulated businesses.

National Energy Regulator

Currently there are about a dozen organisations administering the gas and electricity access Codes. This current situation has grown out of state parochialism rather than a fundamental need for so many regulators. There is an inconstancy between the stated objective of impartial regulation, while maintaining state based energy regulation for state owned energy assets, which is not resolved by including "Independent" in the name of the regulatory organisation. State based regulation of national energy markets is inappropriate. A single, competent and well resourced energy regulator is required to administer access and this would assist in the goal of achieving consistency across state boundaries and between gas and electricity.

Access and Competition

The National Access Regime must be extended to include the concept that regulators are also responsible for the promotion and protection of competition. The fact that access alone exists is sometimes not enough to prevent an incumbent retailer (particularly if it is vertically integrated and owns infrastructure as well) from continuing to frustrate competition via both price and non price barriers. The full benefits of access will only be felt when incumbent retailers are prevented from acting in an anti-competitive manner.

Investment and Regulated Open Access

BHP Petroleum has direct experience with pipeline investment in a regulated, open access environment. BHP Petroleum formed a joint venture with Westcoast Energy to develop the Eastern Gas Pipeline (EGP) in 1995. A key reason for this timing was an expectation that a regulated open access regime would be established in NSW to enable gas sales to be made directly to gas users. This regime did eventuate, and by 1998 sufficient end use demand had been contracted to enable this \$450m project to proceed. Hence this project was enabled by regulated open, access, not hindered. BHP Petroleum was successful in selling its interest in the EGP project prior to construction, and the sale was not hindered by the existence of the Gas Pipelines Code.

BHP Petroleum is currently involved in two further interstate pipeline projects, with one attracting a wide field of interested pipeline developers.

There has been substantial investment in other gas pipeline and distribution projects during the introduction of regulated open access. There has also been investment in downstream retailing companies (eg formation of Pulse) and evidence of an upturn in upstream gas exploration in Eastern Australia.

There is no evidence apparent to BHP that investment in economic pipeline projects has been deterred by regulation.

If the Commission wishes to discuss any aspects of this submission or the attached paper please contact me on (03) 9652 7398.

Yours sincerely,



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Ref: cm:rp:2601

Attach.

What Price Access?

Access to Gas and Electricity Networks in Australia

Prepared for

BHP Petroleum

by

Bob Lim and Co Pty Ltd

February 2001

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1 Executive summary

The National Access Regime has delivered considerable benefits to the Australian economy and our international competitiveness. Competition has been fostered, new markets are developing and prices for users of natural monopoly energy infrastructure have reduced as some monopoly rents have been removed.

The price of access to energy infrastructure affects inputs to diverse users in most sections of the Australian economy. Efficient access to natural gas and electricity networks is essential to achieving the objectives of international competitiveness. Monopoly rents extracted by assets owners have a direct and tangible impact on consumer welfare.

Natural gas and electricity networks, unlike many other forms of infrastructure, are easily identifiable as natural monopolies. The respective industries have developed National Codes to provide open access consistent with National Competition Policy.

Any analysis of the costs and the benefits of access regulation of energy infrastructure to date will show that the benefits outweigh the costs.

However, it is BHP Petroleum's view that more needs to be done in the area of access to energy infrastructure. The purpose of the National Access Regime is to benefit Australia's international competitiveness by reducing the cost of this infrastructure. The policy objective should be to encourage competition where possible and where it is not, that is in the case of natural monopolies, to regulate so as to eliminate monopoly distortions.

However, monopoly rents are not mere income redistribution matters. Monopoly rents can be detected through persistent supernormal returns on invested cash flows and regulatory tests should be established. Monopoly rents operate as disguised quasi-taxes on the rest of Australian industry, just like embedded indirect taxes.

Recommendation 1 Maintain an Effective National Access Regime

While a National Access Regime should set the framework for access, there is no "one size fits all" answer to regulation. The gas and electricity industries, following different paths, have established national codes that seek to establish principles for access in each of these industries. These codes, while imperfect, have delivered the benefits of competition by opening downstream gas and electricity markets to new players. The codes, particularly the National Gas Code, have provided an effective, if not wholly efficient mechanism for determining the price and terms of access to natural monopoly energy infrastructure.

Recommendation 2 Maintain and Enhance National Gas and Electricity Codes

The National Access Regime provides the legal and policy underpinning for the National Gas and Electricity Codes. The codes are an effective means of addressing the detailed issues that are specific to the gas and electricity industries.

Recommendation 3 The National Access Regime to provide framework for Efficient Industry Specific Codes

There are deadweight efficiency losses to the economy if monopoly rents are allowed to arise through lax regulatory practices for strategic infrastructure sectors and raise the cost levels of industries competing on international markets.

The National Access Regime must ensure that infrastructure owners do not take monopoly rents. The Access Regime must eliminate the use of tools such as asset revaluation to maintain rents for owners against the interests of users and the national economy. Asset valuation methodologies such as Depreciated Optimised Replacement Cost (DORC) are fundamentally flawed and serve only to preserve monopoly rents and charge users costs that were never incurred.

Where infrastructure costs are to be recovered from users, it is essential that users are only charged their actual costs and not inflated or notional replacement costs. Depreciated Actual Cost (DAC) should be used as a pricing principle. Asset revaluations through measures such as depreciated optimised replacement cost (DORC) should not be used in measuring capital bases. To do so is to entrench monopoly rents and charge users for costs never incurred.

Regulators or at best the regulators' inability to resolve conflicts between owners and users, have allowed massive revaluations of assets by owners so that users are paying many times over for the use of assets. Book valuations have little to do with the cost of service and less to do with enhancing international competitiveness of companies that must use these inputs.

DORC is not economically efficient, is inconsistent with other economic, accounting and legislative practices and should not be proscribed as a valuation method for capital bases.

Assets should be maintained at reasonable book values based on the depreciated actual cost of the asset (DAC). Users should pay only once for assets based on fair construction costs amortised over reasonable asset lives. Maintenance of assets should not trigger revaluation.

Recommendation 4 Regulated Assets to be Valued at Depreciated Actual Cost (DAC)

Just as accounts are kept for the purpose of reporting asset value and returns on investment to shareholders and for the purposes of reporting taxation depreciation, monopoly asset owners should be obliged to keep a statutory, standardised and consistent accounts for regulatory purposes. This would avoid continual argument between the regulator and the infrastructure asset owner about the value of regulated assets and would allow relatively straightforward determination of the reasonable returns for the asset owner.

Recommendation 5 Asset Owners to Maintain Regulatory Accounts

The fair, rational and consistent pricing of natural monopoly energy infrastructure is key to making open access work and delivering the promised benefits to the economy. It is therefore essential that the National Access Regime includes Pricing Principles.

Vertical separation is not sufficient to ensure competitive outcomes. A series of bottleneck monopolies can be even less efficient than an integrated monopoly.

However, BHP Petroleum recognises that Short Run Marginal Cost (SRMC) is not a reasonable or practical basis for pricing natural monopoly energy infrastructure. However, this should not permit asset owners to engage in price discrimination in the market that unfairly burdens the price inelastic industrial users. To avoid this the cost of service, whilst being above SRMC, should be based on efficient actual cost.

Recommendation 6 A National Access Regime must include Pricing Principles

Recommendation 7 Pricing Principles should Allow Returns on Reasonable Actual Investment Only

The goal of regulation should not be expressed as “light-handed” or “heavy-handed” regulation but rather “effective” regulation. It may be argued that “light-handed” regulation has been a failure in the United Kingdom as much as the US style “heavy-handed” regulation that the UK model sought to avoid. Price cap regulation has been insufficient to prevent regulated industries gaining monopoly profits by overstating projected capital expenditures. Asset revaluations have embedded monopoly taxes on British industry.

Ample evidence exists to show that investment projects continue to be proposed and constructed despite the introduction of access. This is particularly the case in the newly competitive downstream sectors. Where investment is a problem (eg power plant) there is no evidence to suggest that this is a result of open access. On the contrary, it may be argued that Access has enhanced the options to solve other more fundamental problems with these particular markets.

There is no evidence to support the contention that the existence or implementation of a National Access Regime has deterred infrastructure investment.

Recommendation 8 A National Access Regime must not distort the principle of open access nor condone capture of monopoly rents in the name of encouraging investment

Efficient regulation requires that Regulators are properly resourced and have access to all relevant information. Political interference in the process must be removed.

National Access Codes for Electricity and Gas are relatively efficient. However, improvements can still be made. In particular the Codes need to balance the rights of appeal between owners and users.

The operation of National Codes is frustrated by derogations by State interests. With a proliferation of regulators, regulatory outcomes are far from uniform. State regulators have

weakened the impact of the Codes by poor decisions or by decisions that stopped short of implementing the Codes. In some cases jurisdiction shopping is used to delay decisions. Non uniform appeal processes create additional uncertainty.

Recommendation 9 Establish a Single well-resourced specialist Energy Regulator

Even with National Codes infrastructure owners can act in ways that preserve monopoly rents and prevent competition. On occasions, regulators have become captive of the regulated, partly through lack of disclosure and an unwillingness to enforce competitive outcomes against the interests of the regulated entities, especially State governments.

A model statement of purpose comes from the Office of Gas and Electricity Markets in the UK who understand this broader responsibility of a regulator to promote competition (<http://www.ofgas.gov.uk/about/responsibilities.htm> 13 December 2000).

“Our main tasks are to:

- Promote competition in all parts of the gas and electricity industries by creating the conditions which allow companies to compete fairly and which enable customers to make an informed choice between suppliers;*
- Regulate areas of the gas and electricity industries where competition is not effective by setting price controls and standards to ensure customers get value for money and a reliable service.”*

Recommendation 10 A National Access Regime should specify that regulators promote and protect competition

Non price barriers to competition are important to ensure effective access. Regulators must be competent to probe beyond the cost of service in order to eliminate other possible barriers. An incumbent can effectively use issues such as technical standards for interconnection, allocation of interconnection costs, product specifications and balancing regimes to frustrate access for new competitors.

Recommendation 11 The Access Regime must address non price barriers to competition

2 Significance of the Inquiry

This is a critical inquiry and will have an important bearing on the future regulatory model to apply to third party access regimes for key economic infrastructure, and hence the infrastructure costs faced by the Australian economy.

Infrastructure is a central concern of the national competition policy process. Two issues traditionally are of the greatest importance: (1) the adequacy of infrastructure; and (2) access to, and pricing of, infrastructure services.

The Chairman of the National Competition Council notes that "...Infrastructure sectors such as energy supply, transportation, communications and water supply play a pivotal role in the Australian economy. They generate major business inputs, representing between 7 and 16 per cent of production costs for most Australian industries and also provide essential services to the community. Any inefficiencies in infrastructure provision directly impact on Australia's growth, competitiveness, and ultimately on living standards." (Samuel 1998, p 1)

There are strong and positive links between infrastructure provision and economic development. One only has to contrast with the decaying infrastructure of some African countries with the enormous modernisation of infrastructure that has occurred in places such as Hong Kong and Singapore to realise that public and private investment in first-class infrastructure is crucial to first-class economic performance. Nor is it a matter of building the infrastructure once and for all. Ongoing infrastructure investment and development is necessary for a country to stay in the top leader of developed nations.

As FitzGerald (1994, p 14) notes "It is beyond dispute that investment in economic infrastructure, much of it traditionally publicly provided, affects the productivity of the private sector capital stock. Obviously, for example, the productivity of a truck depends very much on the availability and quality of roads where the goods are to go. No one, therefore, doubts that the efficiency of, say, our ports and airports – and our transport and handling system as a whole – is an important ingredient in our international competitiveness."

There have been considerable economic benefits from opening up access to infrastructure. Former public sector monopolies have been forced to examine their assets and labour management practices. Goldplating and featherbedding have come under close scrutiny, given that third parties will be expected to pay. Many of these changes were already developing under microeconomic reform, corporatisation or privatisation policies, but third party access provides a litmus test of the success of reform. Just as the abolition of iron ore export controls opened the way for the development of Australia's great exporting industry, so the removal of infrastructure inefficiencies can open up the development of whole new industries serving both domestic and overseas customers.

The ultimate purpose of third party access is to maximise the productivity of Australia's land, labour and capital to deliver the highest possible standard of living to the Australian people. The argument for competitive markets rests fundamentally on the presumption that free and competitive markets will deliver the highest incomes overall to Australians. Unlocking the infrastructure through third party access is already delivering benefits and these benefits should be fostered. For example, new pipelines and the expansion of gas markets are resulting in clear benefits to consumers and gas-using industries. A key to unlocking these benefits has been information disclosure and informed economic regulation.

Informed economic regulation is necessary because it is not sufficient in the real world for a policymaker to say "Let us assume that markets are open and competitive." In the real world, there are such things as natural monopolies, bottleneck facilities, wasteful duplication, destructive competition and monopolisation. Economists may theorise in textbooks about perfect competition but the practical problem of microeconomic policy in the real world is often one of ensuring that the natural tendency of human beings to compete is not allowed to degenerate into competing for capture of monopolies: the players must play on the field and cannot be allowed to kidnap the umpire or seize the goalposts. The US "essential facilities" doctrine, from which Australia's third party access regime traces its intellectual genesis, was nothing more than an attempt by the US Courts to ensure that unbridled competition and a ruthless assertion of property rights could not be used to monopolize markets by capture of crucial strategic infrastructure.

3 International Competitiveness

3.1 Effective Access is necessary for International Competitiveness

Australian industry is no longer sheltered by import tariffs. This is the result of conscious economic policy, adopted on a largely bipartisan basis, which recognised that past ideas of “protection all round” were unsustainable and amounted to export taxation of our most competitive and productive industries. “Protection all round” was a luxury which could only be afforded through the dissipation of Australia’s resource rents. Australian policymakers, and to a very large extent, the Australian public have recognised that attempts to quarantine the Australian economy and manufacturing sector from world competition would, in the end, produce the sort of dismal economic performance which characterised Argentina’s decline after World War II. During the 1980s, Australians became aware that other countries such as Singapore and Hong Kong were catching up with, or even overtaking, our per capita living standards. Tariff reform of goods markets went hand-in-hand with liberalisation of labour and capital markets, as Australians recognised that international competition was a matter of necessity not of choice.

The results of these reforms have been notable. The stagnation of Australia’s economic performance following the 1970s was reversed and Australian productivity started to rise again. True it is that progress has not been uniform or without debate and that questions have been raised about the extent to which public sector expenditure has been reformed, but, that said, there are few who would argue for winding back the bulk of microeconomic reform. Third party access to natural monopoly energy infrastructure has to be seen as a logical continuation of the process of microeconomic reform and as an essential part of the overall process of lifting Australian living standards in the world league.

Although a conceptually difficult exercise, the Industry Commission (1995, p 63) estimated that State and Commonwealth reforms associated with Hilmer could produce gains in real GDP of between 5.65 and 8.33 per cent. These gains logically flowed, inter alia, from the impact of competition reform in opening up natural monopoly energy infrastructure and ensuring capital was not wastefully invested. Without wishing to enter into a discussion of the limitations of economic modelling, it is quite likely that the dynamic benefits of breaking open monopoly infrastructure may have been under estimated.

From a policy point of view, economic theory suggests some basic rules of thumb regarding monopoly and competition.

- If a monopoly is an artificial one created by legislation, the legislation should be repealed.
- If a monopoly is a natural monopoly arising out of circumstances such as decreasing costs, prices should be set at a marginal cost and any access deficit met out of public funds. As a second-best, if there are higher deadweight losses associated with raising public funds,

user charges may be imposed to cover the access deficit but not so as to yield a monopoly rent to the owner of the monopoly facility, be it government or private sector.

- Scarcity rents for existing resources or facilities are acceptable and efficient as a means of rationing demand and calling forth further supply of a resource or substitutes but must be distinguished from monopoly rents demanded where there is no scarcity of capacity and no incentive for augmentation of supply.

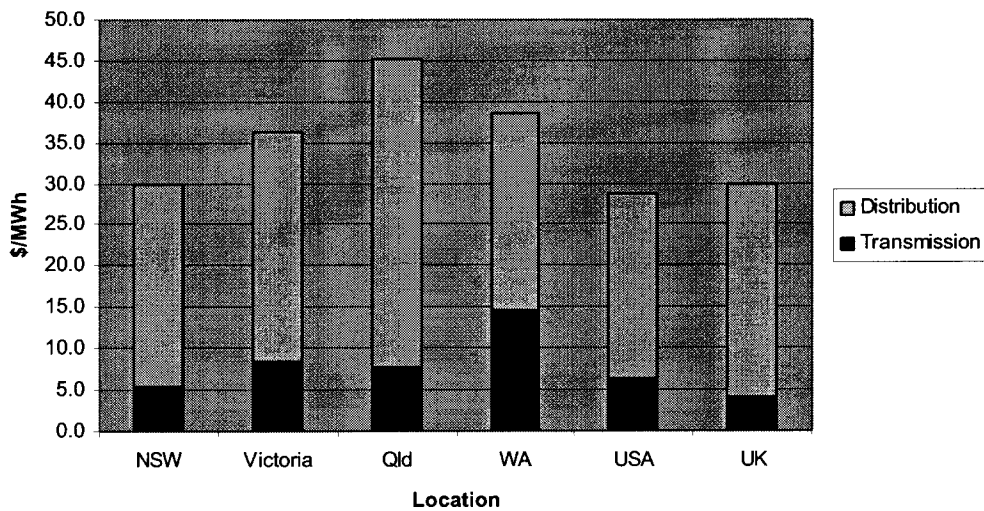
Thus producers should have the benefit of competitive inputs wherever possible; and where inputs cannot be competitive, producers requiring those inputs should have the benefit of the economic regulation to ensure that distortionary indirect taxes are not being levied in the guise of monopoly rents.

Access regimes should encourage upstream and downstream competition and by regulation remove bottleneck rent-seeking. There is not much point in lowering tariffs to create competitive markets if local industry is rendered uncompetitive by natural monopoly infrastructure rent charges.

Case Study 1 Electricity: Transmission And Distribution Network Charges

Since the National Electricity Market came into operation in 1998, Australian regulators (ACCC and State regulators) have completed pricing reviews on transmission networks in New South Wales and on distribution networks in New South Wales, and Victoria. Queensland is currently reviewing its distribution networks.

Transmission & Distribution Costs



Source: Bardak Group

The chart, however, shows that average Australian transmission and distribution network charges generally remain substantially above levels applying in the USA and the UK. Queensland and Western Australia transmission and distribution network charges (which have not been subject to regulatory reviews) are considerably above USA and UK charges. Victorian distribution networks charges are also less competitive, even after the recent State regulatory review.

In NSW transmission network charges (which have been reviewed by the ACCC) are comparable with average levels in the USA and the UK, but distribution network charges are substantially higher (notwithstanding the completion of a recent State regulatory review).

The significant points that emerge from this analysis of average network charges are that Australian electricity network charges remain substantially uncompetitive when compared with average USA and UK charges and will remain so for the next few years. In those States (NSW and Victoria) where State regulators have completed pricing reviews, distribution network charges have been reduced but they remain substantially uncompetitive. It is clear that inflated asset values are embedded in the networks, and it will take some considerable time (next regulatory review) for another opportunity to unwind the embedded rents and, for Australian network charges to be more competitive with USA and UK levels.

In Australia, natural monopoly infrastructure is regulated under both Federal and State legislation. Telecommunications, for example, are subject to Federal legislation while water, gas and electricity reticulation and distribution are also regulated by State regimes.

The Issues Paper makes little reference to State access regimes. Yet there is policy incoherence if State and Part IIIA access regimes are built on different principles regarding measurement of costs and pricing. It is essential for any truly national competition policy that optimal access and pricing rules be applied across both the State and Federal access regimes, so that monopoly rents are not protected by jurisdictional forum shopping, another form of regulatory gaming.

3.2 Deadweight loss (excess burden)

A key economic issue concerns the implicit model of economic efficiency being employed by the Productivity Commission in its Issues Paper. The Commission does not mention the crucial economic concept of deadweight loss (excess burden) which applies to excessive infrastructure charges just as much as it applies to taxes. Just as taxes on labour or capital distort economic choices and reduce the supply of factors of production, so access regimes which allow monopoly rents act as quasi-taxes on other producers and consumers and result in a sub-optimal economic outcome.

The categorisation of monopoly rents as a form of distorting indirect taxation flows naturally from the classical work of Dupuit, Hotelling, Vickrey and others who have demonstrated the optimum qualities of short run marginal cost pricing (SRMC). This categorisation is not disturbed by the modern work of those such as Baumol and Bradford who have argued for Ramsay pricing as a second-best alternate to short run marginal cost pricing where there are access deficits to be made up. Both classical and modern schools of thought would combine in categorising as a monopoly rent -and a tax - any charge which resulted in supernormal returns to capital investment, that is, any form of pricing above average cost. The difference between the two schools of thought simply relates to the best method of funding the access deficit rather than any difference over the undesirability of monopoly rents being allowed by regulators.

It is incorrect to try to separate the existence of monopoly rents from economic inefficiency by suggesting, as the Issues Paper appears to, that monopoly rents may merely be income redistribution devices. Any monopoly rents levied by infrastructure owners represent a form of taxation of intermediate inputs to production or of consumers. As Laffont and Tirole (2000, p 86) remarked “taxpayers in a procurement context and consumers in a regulatory context are hurt when the firm enjoys a rent, since they then have to pay higher taxes and prices for the services, respectively.” For example, inflated gas or electricity transmission charges feed into the costs of energy using industries and distort production and consumption patterns.

It is also erroneous to suggest that two-part tariffs eliminate the economic inefficiencies created by the extraction of monopoly rents by, for example, gas pipeline owners.

This is because fixed access or connection charges are *not* “lump sum taxes” and do not share their optimality properties because, unlike lump sum taxes, they *can* be avoided by changes in producer or consumer behaviour. What is required for optimality is that no tax or charge alter choices at any margin, that no action *of the user* can alter the charges he faces and high interconnection charges fail this test of optimality. For example, consumers may not connect to the system or have fewer connections or producers may simply decline to locate using industries in Australia, depriving Australia of income, employment and export opportunities. Indeed, high fixed access charges may sufficiently deter demand that the facility is never built.

And if a facility is built, high access charges can produce another possible undesirable - duplication of facilities by end users faced with no viable alternative. (Cf King and Maddock and Eastern Gas Pipelines). In either case, it is important to note Australia is not a closed economy and that distortions or inflated production costs in Australia will inevitably reduce Australian incomes and living standards - National Competition Policy and access regimes have serious implications for Australian competitiveness.

Regulatory codes need to give higher weights to competitiveness. Australian governments embarked on national competition policy with a view to improving the international competitiveness of Australian industries and thereby improving living standards. However, access regimes sometimes seem to place greater emphasis on charging user industries to recoup infrastructure costs (whether real or notional, sunk or projected) than on allocative efficiency.

Recommendation 1 Maintain an Effective National Access Regime

An effective National Access Regime is a key component of Australia’s National competition policy. An effective National Access Regime must encourage upstream and downstream competition and regulate midstream to remove bottleneck rent seeking.

While a National Access Regime should set the framework for access, there is no “one size fits all” answer to regulation. The Gas and Electricity industries, following different paths, have established National Codes that seek to establish principles for access in each of these industries. These codes, while imperfect, have encouraged competition by opening of downstream gas and electricity markets to many new players. The codes, particularly the National Gas Code, have provided an effective, if not wholly efficient mechanism for determining the price and terms of access to energy infrastructure.

The National Access Regime provides the legal and policy underpinning for the National Gas and Electricity Codes. The Codes, with improvements, should provide a more effective means of addressing the detailed issues that are specific to the gas and electricity industries. Regulatory inconsistencies and other inadequacies, especially at State level still need to be addressed.

Recommendation 2 Maintain and Enhance National Gas and Electricity Codes

An effective National Access Regime must maintain and enhance the development of appropriate industry codes. In particular the National Access Regime must continue to provide the framework for the development of the National Gas Code and the National Electricity Code.

4 The Scope of Access

4.1 Monopoly Rents and Asset Revaluation

Access regimes are not necessary for production facilities where those facilities are available on a competitive basis. From an economic point of view, access provisions are only necessary for natural monopolies, principally network utilities. As Newbery (1999, p 27) notes, network utilities “provide the clearest example of natural monopolies, that is, cases where a single firm can satisfy the entire market demand for the range of goods or services at a lower total cost than any other combination of firms.” Thus a crucial feature is economies of scale. Another feature which is relevant is the presence of network externalities. Newbery (1999, p 28) remarks that “Network externalities arise where the benefit to one user depends on the number of other users connected to the network, telecoms providing the leading example.”

It is therefore not sufficient that a plant be capital intensive or large for it to be open to an access declaration. If a plant shows diminishing returns to scale or can be reproduced in smaller versions, such as mini steel mills, there is no economic argument for access. The argument for access depends on natural monopoly. If a competitor is free to duplicate plant in circumstances where competition is not wasteful, access provisions are irrelevant. Almost invariably, it will be found that manufacturing or processing plants are reproducible in greater or smaller versions and do not exhibit natural monopoly characteristics.

Network infrastructure, rather than manufacturing plant, is pre-eminently the area where access provisions will be relevant. It is necessary to define what is meant by a network. For example, computers may be networked within a home or office but that there is no public interest in treating such a network as one that should be subject to an access declaration. In such a case the network is entirely internalised as part of the production process.

Typically, a network will exhibit natural monopoly characteristics where it connects more than one user, travels past other potential users and is essential to reach the final market. That is why natural monopolies are often described as bottleneck facilities: for practical purposes, you must use them to get to the final market. Whether a facility is or is not a natural monopoly depends on technology but is not determined by it. For example, the advent of satellites has meant that long-distance undersea or underground cables are not the only means of carrying communications but if the total volume is still constrained by capacity one might argue that satellite and cables together still exhibited natural monopoly characteristics. Sometimes new technology may destroy natural monopoly but, at other times, it may simply result in more claimants sharing monopoly rents.

Though described as natural monopolies, network utilities often enjoy specific statutory grants; that is, legislated monopoly rights. For example, telecommunications carriers are licensed and water, electricity and telephone carriers have statutory easements over other persons' privately-held land. Where there are such statutory privileges for network utilities of access to or over the land of third parties, it tends to demonstrate that the network is a

natural monopoly, since the rationale for such privileges is to avoid wasteful competition inherent in natural monopoly situations, as Newbery (1999, pp 18-24) notes in a brief overview of the history of network infrastructure.

4.2 Industry Structure Issues

Vertical integration, whether real or virtual, is a competition issue. Pseudo-structural separation via contractually tied affiliates is still vertical integration. Management or service contracts with ostensibly unaffiliated infrastructure owning entities allow avoidance of attempts to limit monopoly rent charges. There is no reason for utility owners not to try such manoeuvres but one may question whether Parliaments, Codes, regulators and Courts should applaud their efforts.

In any case, even with vertical structural separation, monopoly pricing incentives remain and are distortionary. Vertical separation is not enough to ensure efficient outcomes. Indeed it may be worse than an integrated monopolist, because it increases the chances of non co-operative stalemates. An integrated monopolist has some incentive to allow traffic over the network but a disintegrated system may be subject to strategic blocking behaviour. Looking at the classical example of the river Rhine in the Middle Ages: each baron demanding a toll from river traffic was vertically separated from his often hostile neighbours but collectively their exactions strangled the commerce of the Holy Roman Empire. Indeed, that is why easements were granted by statute for canals, roads, railways and utility networks in the first place, since each landholder stood to gain from blocking the whole system and transactions costs were overwhelming. If one wishes to see what happens to a vertically disintegrated system, one should look at the problems of PNG Telikom trying to negotiate with individual tribes demanding rents for their mountain tops - it costs little to say no and the rewards for blocking behaviour are potentially great. It is simply naive to assume that multiple bottleneck monopolies produce a competitive outcome.

The possibility of, on the one hand, cut-throat competition between competing full length systems and, on the other hand, blocking behaviour along disintegrated chains was why the great nineteenth century entrepreneurs such as Commodore Vanderbilt and John D Rockefeller sought to eliminate “wasteful competition” and sought to achieve vertically integrated systems with no parallel competitors. Although competition and monopoly are usually seen by economists as opposite terms, as J S Mill and Israel Kirzner recognized, there can well be competition *for* a monopoly advantage.

It is thus a matter of concern and surprise that the Issues Paper suggests a preference for “light handed” regulation and limiting the application of mandatory third party access regimes only to cases where there is vertical integration. Given that Australian industries face internationally competitive export markets, it should be totally unacceptable that their costs can be inflated by monopoly rents embedded in infrastructure costs, simply because the monopolies concerned are not integrated under one ownership structure.

Arguments that effective “light handed” regulation can be built on the concept of abuse of market power seem misconceived. As the *Clear Communications* case showed in NZ,

monopoly rents may not be removed under such a regime. Although the Privy Council decision in that case turned on the particular legislation involved, it does show the danger that 'light handed' regulation may be quite ineffectual in removing monopoly rents and barriers to efficiency. Unless one *defines* "abuse of market power" in the Australian context as including a situation where monopoly rents exist; that is, super-normal profits are consistently gained, the concept cannot be made operational in the access context to help deliver an efficient outcome.

Recommendation 3 The National Access Regime to provide framework for Efficient Industry Specific Codes

The National Gas Code and National Electricity Code have proven to be effective in implementing the principles of the National Access Regime. The National Access Regime must continue to provide the framework for industry specific Codes and permit the evolution of those Codes, particularly in the area of energy infrastructure.

5 Monopoly Rents and Asset Revaluation

5.1 Replicating a competitive market outcome and monopoly rents

The object of natural monopoly regulation is to replicate a competitive market outcome. In a basic sense this might be seen as a futile exercise or an impossible hypothetical task. In practice, what is sought to be achieved is more likely to be a contestable market, one in which the incumbent monopolist cannot abuse his monopoly position so as to extract super normal profits (monopoly rents) or interfere with downstream competitors or associates. One expects the prices will tend to equal to costs of production, though there may be a band of acceptable prices rather than a unique price, given that the product may not be homogeneous

Other tests for the presence of monopoly may include *Herfindal indices* of industrial concentration or *Tobin's q ratio* to compare the capitalised market value of existing assets with their replacement cost. If the market value of existing infrastructure assets, as reflected in the market value of shares in their owners, consistently exceeds the cost of new construction it is a sign that monopoly rents exist for that infrastructure owner.

In the early stages of deregulation, regulators may tend to focus on price caps such as CPI - X to squeeze out initial embedded monopoly rents. But as regulation continues, inevitably regulators must focus on the cost of service (as in the National Gas Pipelines Code). A price cap may be too generous or, if too severe, may lead to under investment. The question of testing for super normal profits (evidence of monopoly rents) cannot be avoided by using a price cap formula.

In the parliamentary processes surrounding passage of the *Competition Policy Reform Bill 1995* it became apparent from Treasury answers to Parliamentary Questions on the Bill in the Senate Economics Legislation Committee (Hansard 27 June 1995, p 1871 seq, reproduced in BCA (1995) at pp 96-102) that securing a commercial return on investment is a major part of policy.

In that context the valuation of assets becomes of fundamental importance. If governments and their advisers or consultant accountants are allowed to put inflated values on assets (whether those assets are to be privatised or corporatized and retained in public ownership) and a regulatory regime is to be put in place to allow the owners of those assets to charge on such inflated values then the scope for massive distortionary pricing above actual average - let alone marginal - cost is very large indeed. There has been concern that asset write ups have occurred in some State electricity reforms and that charging monopoly rents may be thereby legitimised. There have also been concerns that the sale of some infrastructure assets such as gas or electricity distribution networks secured prices for governments which represented the capitalised value of privatised monopolies rather than the value of anticipated efficiency gains.

What is a rent? A rent is a payment in excess of what is necessary to obtain the services of a resource; it is an infra-marginal surplus. What is a monopoly rent? A monopoly rent is a rent enjoyed by virtue of lack of competition: it shows as a persistent return over the cost of capital. Valuations not based on actual costs are a means of creating or preserving monopoly rents. If regulated businesses are allowed to set charges at levels which pay for costs not actually incurred than they are being given monopoly rents.

Note that there is a parallel in measuring monopoly rents with identifying resource rents. In resource rent taxes and land value taxes, the rent element is computed without allowing owners to revalue capital invested on such bases as depreciated optimised replacement cost (DORC).

There is some disagreement as to what constitutes a monopoly rent. Some accept that an initial capital base above depreciated actual costs necessarily involves monopoly rents which will be washed out as the initial capital base is depreciated while others argue that there is no monopoly rent provided the initial capital base is below depreciated optimized replacement costs, DORC, (even if that figure is above the utility owner's actual unrecovered costs). But assuming excess returns to capital and labour represent a rent (as exemplified in the structuring of resource rent taxes) it seems that the former view is correct: to the extent utility owners succeed in having capital bases accepted which exceed their actual costs they gain a windfall monopoly rent.

The concessional nature of many of the valuations used to determine initial capital bases seems to be implicitly conceded by the common practice of denying further revaluations of the capital base once the initial capital base is set and the common reluctance to allow statutory easements given for free to be revalued and included as part of the capital base.

5.2 Reality checks

The persistence of monopoly rents demonstrates a failure of access regimes. The acid test of a competitive market is that no player is able to earn super-normal profits on invested capital (monopoly rents). Regulators should be required to test for monopoly rents and explicitly address three questions before accepting any access undertaking.

What is the rate of return on shareholders' funds?

What is the internal rate of return on cash flows in and out over (say) the last 15 years and projected over the access undertaking period?

What is the payback period? How long does it take full net operating revenue to recover the capital base?

In addition, regulators should question situations where market valuations of utility businesses are substantially in excess of net tangible (constructed) assets. The "goodwill" may be merely a reflection of capitalised future monopoly rents.

5.3 Value and cost in a competitive market

Because utility regulation eventually has to focus on the costs of service that may be charged to users, the concept of cost assumes great importance. Typically, the total revenue to be recovered through user charges is calculated so that the total revenue allowed is equal to the cost of providing a service.

The cost of providing a service is then calculated by adding together a return on the capital represented by the infrastructure, the depreciation of the capital base (depreciation); and the operating, maintenance and other non-capital costs incurred in providing all services provided by the infrastructure (non-capital costs).

What is required for a fair access regime is a correct determination of *costs* incurred by the access provider in creating the physical capital assets that make up the infrastructure network facility.

The whole idea of economic regulation is to avoid abuse of monopoly power by ensuring that natural monopolies do not charge users more than would be charged in a hypothetical competitive market where “values” were constrained by the *actual* costs incurred by competitors. Equally regulation seeks to protect investors in natural monopoly infrastructure by preventing regulators stripping investors of a competitive market rate of return: regulators must have regard to the investors’ costs and award a fair and reasonable return on capital actually invested (as opposed to the capitalised value of any monopoly rights purchased).

Given the emphasis on replicating the outcome of a competitive market and the emphasis on the capital and non-capital costs of an infrastructure provider, the natural economic sense is to recall that in competitive equilibrium “cost” equals “value”. *The purpose of regulatory asset valuation is to ascertain the cost that would have been incurred in a competitive market by another provider.* Actual costs incurred by the incumbent are the only real factual evidence of “costs” and should be used where available on an arm’s length basis in preference to any process of valuation. It is *real or actual cost*, not *notional or opportunity cost*, which is relevant in determining the replication of a competitive market outcome.

Regulation has removed some monopoly rents but has not gone far enough and the reform of government utilities has not always removed owner’s monopoly rents for the benefit of consumers. As King and Maddock (1996, p 25) comment “...consumers, however, are not directly the principal beneficiaries of improved public enterprise performance.” This has come about largely because improper valuations have often been used to inflate access prices. Depreciated actual cost (DAC) is the *prima facie* real cost on which any initial capital base should be erected but has often been displaced by higher replacement cost valuations.

Case Study 2 Revaluation of Natural Gas Pipelines for Pricing Purposes

The pricing of access to natural gas pipelines by regulators has not delivered all the gains to Australian industry and domestic consumers that it should have. Without exception, regulators have determined regulatory capital bases for the pipelines they regulate that are in excess of the depreciated actual cost of the pipeline (refer table).

This revaluation of infrastructure for regulatory pricing purposes costs Australian gas users between \$300 and \$350 million/pa in increased return on capital and depreciation charges. (BHP Petroleum estimates that the cost to the industrial and commercial sectors of the economy is at least \$220 million/pa.) This transfer from industrial and commercial end users to the owners of transmission and distribution infrastructure directly impacts the economies ability to compete on the export market and replace products that are currently imported.

The welfare of domestic consumers is also reduced by the value transfer that has been allowed by regulators. BHP Petroleum believes that a similar analysis of the electricity transmission and distribution sector of the economy would show a much greater transfer of value to infrastructure owners.

The Productivity Commission must prevent the continued wholesale revaluation of energy infrastructure assets.

Table 1 Depreciated Actual Cost of Covered Pipelines versus the Regulatory Capital Base (RCB)

Assets	DAC Value Sm	RCB Sm	RCB/DAC %	Regulator	Comment
Final Decisions					
Victorian Transmission	186	364	196%	ACCC	Final Regulatory Decision October 1998
Victorian Distribution	1115	1870	168%	ORG	Final Regulatory Decision October 1998
NSW Wagga Distribution	15	28	187%	IPART	Final Regulatory Decision September 1999
NSW Albury Distribution	10	22	220%	IPART	Final Regulatory Decision December 1999
NSW CWP Transmission	28	28.5	102%	ACCC	Final Regulatory Decision June 2000
WA Distribution	300	536	179%	OffGar	Final Regulatory Decision June 2000 Note: DAC 30/6/98 & RCB 31/12/99
NSW AGL Distribution	961	1550	161%	IPART	Final Regulatory Decision August 2000
WA Parmelia Transmission	1	62.5	6250%	OffGar	Final Regulatory Decision October 2000 Note: DAC BHP estimate based on Draft Decision statement by regulator that DAC likely to be close to zero
ACT Distribution	90	175	195%	ICRC	Final Regulatory Decision November 2000
Total Final Regulatory Decisions	2706	4636	171%		
Draft Decisions					
SA Transmission	294	310	105%	ACCC	Draft Regulatory Decision August 2000 Note: DAC is depreciated sales price real DAC is \$38 million
WA Tubridgi Transmission	10	17	170%	OffGar	Draft Regulatory Decision August 2000 Note: BHP estimate based on OffGar draft determination that DAC could be anywhere between \$3.6 & 16.7 million
Total Draft Decisions	394	497	126%		
Service Provider Numbers Not Endorsed or Checked by Regulators					
NSW MSP Transmission	473	666	141%	ACCC	Note: DAC is depreciated purchase price not real DAC
WA DBNG Transmission	1331	2570	193%	OffGar	
NT Transmission	235	265	113%	ACCC	
SA Riverland Transmission	15	15	100%	ACCC	Note: DAC is depreciated purchase price not real DAC
Total Proposals	2054	3516	171%		
Total All	5064	8474	167%		
Incomplete Information					
SA Distribution	?	632		SAIPAR	Note: Draft Decision in April 2000 contained no attempt by regulator to determine DAC & Service Provider did not disclose
WA GGT Transmission	?	453		OffGar	Note: Service Provider did not disclose DAC in their proposed Access Arrangement

Note: Pipelines in Queensland have not been included in this analysis. Under Queensland's derogation from the Code Service Providers are not obliged to disclose cost information used in setting Reference Tariffs.

5.4 Costs versus valuations

In economics, as in ordinary English, "value" is not synonymous with "cost". However, a "value" may be used as a proxy to determine "cost" *where other evidence is not available*. Thus, given a competitive market, if I do not know what you paid for a widget and the cost you have incurred, I may make a good estimate by seeing what widgets are selling for.

But the use of a "value" to measure a "cost" is fraught with danger in the case of a non-competitive market. Value may differ widely from cost where free entry into the market by other suppliers is not possible. In the case of natural monopolies, there is invariably a sharp difference between the original cost of supply for the incumbent and the cost which would be faced by a new entrant now - that is one of the reasons it is a natural monopoly: the incumbent has an inherent cost advantage.

In looking at the concept of cost, it is instructive to note that where a taxpayer is allowed a deduction for a cost or a repair, the Courts have insisted that the cost be *actually* incurred and that the cost must not be notional only. For example, in *FCT v Western Suburbs Cinemas Ltd* (1952) 86 CLR 102, the High Court declined to allow a deduction for notional repairs. This parallels the economic concept of a *real* or actual cost as opposed to *opportunity* cost.

5.5 Valuation as a proxy for cost: real cost versus opportunity cost

As well as legal or accounting concepts of cost, there are economic concepts of cost. The real cost of an article might be described as its cost of production, what is required to bring it into existence. The opportunity cost of an article might be described as what it is worth in an alternative use. Further a distinction may be drawn between a cost and a surplus. If it costs person X \$100 to produce a bushel of wheat and it costs person Z \$120 to produce a bushel of wheat for a market price of \$120, person X reaps an infra-marginal surplus of \$20 over his costs. The market price of his product gives him an opportunity cost of \$120 for relinquishing it.

Often it is argued that regulators should have regard to the opportunity costs of keeping the utility's capital stock in the industry. It may for example be argued that the capital invested in the industry should receive a rate of return commensurate with its value in an alternative use (even if that use is based on retrospective or hypothetical circumstances). It may be argued that the opportunity cost of the capital sunk in infrastructure is its replacement value, and that its historic cost is not relevant to determining a regulated revenue stream or rate of return. On the other hand, it may be argued that sunk capital is sunk capital and that once capital assumes a fixed form as railways or pipes or telecommunications networks, it has lost the opportunity to turn itself into capital elsewhere and its value in alternative use is simply its scrap value. Replacement cost is simply irrelevant as a measure of opportunity cost of invested capital, though it may have relevance for capital replacement decisions.

Any attempt by an infrastructure owner to appeal to notions of opportunity cost as a basis for awarding regulated returns carries some dangers for the owner. For example, depreciated optimised replacement cost (DORC) is a notional concept of cost: what it *would* cost a new entrant or the incumbent owner to replace the existing network. The inference is that the existing network owner should be able to secure a return on what the network *would* cost to replace, not what it actually *has* cost. But that is not the real choice facing a network infrastructure owner. Once his capital has been spent and invested in pipes or pylons, his opportunity cost is its scrap value. His fund of liquid capital has gone and he has physical capital assets. If those physical assets were to be valued on the basis of opportunity cost, that is, their value in another use, then the value would be minimal or zero. A ruthless application of economic logic might suggest that as the assets are sunk assets with no alternative use except as scrap, the initial capital base should be close to zero. There is no opportunity cost where capital has been sunk. No regulated revenue stream has to be awarded to induce investment to create what already exists or to keep in place what has no alternative use.

However, it may be argued to the contrary that such opportunistic *ex post facto* expropriation of the return to past investment will prejudice new investment in the system and that any system of regulation should respect the expectations of investors that they will receive a normal return on capital invested (but not to the extent of allowing them to receive monopoly rents). An interpretation of regulation which gives primacy to depreciated actual cost (DAC) protects an infrastructure investor from the ruthless application of the concept of opportunity cost.

5.6 The concept of capital

Cost and valuation controversies in regulation depend on the underlying implicit concept of capital being used. The concept of capital has had a controversial history in economics which cannot be dealt with here. But it should be noted that there has been strong criticism of the concept of using valuations to determine a concept of capital where those valuations inherently rely on discounting future revenue streams (as all valuations do in a market). The debate between “fundist” and “materialist” concepts of capital is relevant to how regulators should approach their task.

For example if it is assumed that capital and labour are the only two factors of production and that capital is “putty” or “jelly” which can be turned to any other use at any time and which can be measured by its value then questions of divergence between real cost or opportunity cost or of surpluses or monopoly rents disappear. In this world, the law of one price requires that, in equilibrium, capital must receive the same return in all possible uses: else investors can always redeploy their capital. Investment is never irrevocable and one can argue that all capital “owes” its owners a current rate of return available on new investment (because “sunk” capital does not exist and capital is never redundant). In this hypothetical world treating a capital asset as a fund of value measured by replacement cost does make sense. One can never force investors in infrastructure to accept a loss on investment in “stranded” or sunk assets. The problem of losses on mistaken investment decisions does not arise.

Fortunately or unfortunately, the real world is not so arranged: capital is neither homogeneous nor putty, investment is often irreversible and sunk capital often has no alternative use. In the real world capital is not jelly but more like “putty/clay” - that is, once invested, it assumes a physically fixed and irreversible form. Sunk capital is not jelly capital. Once capital has assumed a fixed form as infrastructure it may have no alternative use except as scrap. In the case of infrastructure, once built, it has virtually no other use: it cannot be pulled out and moved to another use, unlike a ship. It is a fallacy to assert that sunk costs “owe” a rate of return to their government or other owners or even that sunk assets should be valued at replacement cost! This is precisely the fallacy Hotelling (1938, p 307) warned about in his example of the Union Pacific railroad. In the real world, economic efficiency does *not* require that the owners of Roman aqueducts still in use should be charging for the replacement costs of what has long since become indistinguishable from a natural river.

Ex ante, private capital will not be invested without the expectation of a profit commensurate with the rate of interest prevailing at the time of investment but, *ex post*, no one has to be charged to validate that decision - only monopolies can do that. A house owner cannot demand that his rents be set by a rent tribunal on the basis that he should earn a normal return on replacement cost. Nor can the world's shipping and mine owners overcome a shipping depression or minerals glut by demanding some international tribunal award them prices to cover replacement costs.

Mobile uncommitted financial capital may earn a rate of interest determined by time preference and marginal productivity but fixed or sunk capital earns Marshallian quasi-rents - its return, once it exists, is determined by demand alone. If no one wishes to use the infrastructure, or the demand is limited, the infrastructure owner will face a loss.

5.7 Asset Valuations

The Commonwealth Treasury (1999, p 62) concedes that rate of return regulation has the consequence that "The firm's capital stock, or rate base, is instrumental in determining the firm's profit. However, there is no clear guideline on how the rate base should be measured. For example, should the capital stock be measured based on the original cost of the capital, its market value, its replacement (present) cost or some other measure? Each measure can yield significantly different results."

King and Maddock (1996, pp 168-169) note that "Many state access regimes are likely to have a significant rate-of-return component, since the relevant assets are often owned by the state governments. If access pricing is determined so as to maximise economic efficiency, for example through short-run marginal cost pricing, then a state treasury may lose significant amounts of revenue. It will be more expedient for a state to value its assets at a high but defensible level, and gain additional revenue via the access regime under the guise, however spurious, of promoting economic efficiency. Access prices can be set by establishing a rate-of-return on the value of existing infrastructure capital. At one extreme, assets can be valued at replacement cost. However, the assets involved are usually irrecoverable and in many cases will never be replaced. For example, existing gas transmission pipelines may be renewed or upgraded but it is unlikely that they will ever be scrapped and rebuilt. The same may be true of water facilities. As a consequence, replacement valuation will simply create an artificially high rate base which can be used to justify high (and inefficient) access prices and large state revenues. At the other extreme, assets may be valued at depreciated historic cost. This leads to a lower rate-base and can only be used to justify lower access prices and state revenues. But even this valuation technique has no foundation in economic efficiency. If the assets already exist, then economic efficiency involves selling access at prices which cover variable costs, not sunk capital costs."

5.8 Scrap (sunk) Values

A major issue in pricing infrastructure access is whether users should be charged for the sunk costs of bringing it into existence. A further issue is whether users should be charged

for the capital “tied up” in stranded infrastructure assets which are obsolete. The idea that capital is “tied up” in infrastructure rests on the mystical John Bates Clark idea that invested capital is a fund which can be called back and released for other uses. But this is not so. Money spent on a railway is spent - what you have is a railway. Its value depends on what demand there is for it and what you may be allowed to charge others for using it. But its value no longer depends on what you paid to construct it - it owes you nothing, no more than the money sunk into any number of failed enterprises can be said to owe their unfortunate shareholders a “return”. Why should capital spent to buy infrastructure be so uniquely privileged against loss?

5.9 Depreciated Actual Cost (DAC)

There are strong argument in favour of using historic or actual costs (DAC) and ruling out notional costs, as noted by Stephen King (1996, pp 94-95) except so far as necessary to prevent transfer pricing between affiliates. “Evaluating allowed returns on capital involves three broad steps. First the regulator must determine the rate base; the value of the infrastructure facility which will form the basis for the calculation of allowed return. The regulator must then determine the allowed rate-of-return to be applied to the rate base. Finally the regulator may place constraints on the prices that the facility owner can charge for various access services in to generate his or her allowed revenue. ... Other countries, particularly the U.S., have a long and chequered history of rate base determination. The experience of these countries provides many lessons for Australia, particularly for the application of access under Part IIIA. Our conclusion, based on this experience, is that, unless there are significant reasons why an alternative rate base method would yield better incentives in a particular situation, *historic or original cost valuation should be used to calculate the rate base.*” [emphasis added]

5.10 Circular valuations

The “market” valuation of an enterprise’s assets necessarily depends on the regulatory regime which controls what is able to be charged to users for those assets. If, for example, there were no regulatory restriction on how much an infrastructure monopolist may charge, his asset values would surge. This might appear to represent an increase in productivity but would, on the contrary, merely represent the capitalised value of “a licence to tax” the general community.

Market purchase prices or flotation values for infrastructure assets may simply represent bidders’ ideas as to what they will be allowed to charge rather than any real cost incurred by themselves or their predecessors in title in creating the infrastructure assets. Because the market value of an asset depends on what you can charge for its use it is inadmissible to value an asset on the basis of its earnings and use that valuation as a proxy for the cost of the asset or as a measure of the owner’s investment in the asset. This error was recognised by the United States Courts in the 1940s. Its genesis was stigmatised much earlier by Eugen von Bohm-Bawerk in his treatise *Capital and Interest*. Bohm-Bawerk (1959, Vol II. Bk I, Ch III, pp55-62) noted that to identify capital (the factor of production) as a fund of value

(as proposed by John Bates Clark) was to confuse the measure of the value of a thing with the thing itself. Net present value (NPV), market value or optimised deprival value (ODV) valuation methods generally employ this approach and hence should be rejected.

It should be observed, however, that current practice in a number of key Australian infrastructure sectors subject to NCP regulatory reviews (e.g. electricity networks and gas pipelines) can result in a self-fulfilling circular process of price formation where ever increasing revenues can flow to the infrastructure owner through inappropriate use of notional cost concepts. This remarkable process – virtually a “wheel of fortune” or an economist’s “free lunch” – of self-perpetuating utility revenue escalation with minimal price reduction (or even price increases) operates as follows.

As Johnstone (1999) explains, the maximum aggregate revenue stream is determined by the sum of (efficient) operating costs and capital costs. There are two elements to capital costs: (i) depreciation and (ii) the opportunity cost of having capital tied up in the business. Expressed as an equation, the periodic revenue stream is calculated as:

$$\text{Revenue}_i = \text{operating}_i + \text{oppcost}_i + \text{depn}_i$$

where revenue is the periodic revenue, operating is the amount spent on operating (non-capital) costs, oppcost is the imputed (opportunity) cost of devoting capital to the entity, and depn is the period depreciation (loss of capital) expense.

Of the three components of periodic revenue, two are determined by the Regulatory Asset Base (determined by the asset owner or the regulator). These are oppcost (the return on capital) and depn (the return of capital). The greater the Regulatory Asset Base, the greater or more lasting both these items. It is obviously in the interest of asset owners and/or governments to obtain a higher Regulatory Asset Base. There is no additional cost to the asset owner as the Regulatory Asset Base is only a “book value”, it is not an actual outlay.

Another way of ensuring self-perpetuating revenues is to continually top up the asset base through the revenues earned through the above equation. This is because periodic capital expenditures are added to the Regulatory Asset Base to augment the amount of capital earning the regulated real rate of return. If the regulated rate of return is attractive, the asset owner will want to leave as much money in the Regulatory Asset Base earning the rate of return by additional capital expenditures or extensive maintenance programs. In addition, because maintenance expenditure is reimbursed through the operating term of the above equation, by judicious maintenance activities, the economic lives of assets may be extended, in which case the provider can push out the length of its (real rate of return earning) inflated investment with no net cash input of its own.

5.11 Replacement Cost Valuations and DORC

The use of an implicit concept of jelly capital has been used to justify DORC as an “economically efficient” measure of infrastructure costs which users must pay. But DORC is not “economically efficient” and can mean that capital costs are inflated to embed

monopoly rents. DORC often results in a measurement of “costs” well in excess of what was actually ever spent.

Allowing utility owners to use DORC asset valuations would be like putting a regulator over BHP who set the price of steel in Australia at a price which covered the replacement cost of the Newcastle steel works. Operating in more and more competitive markets BHP did not have such a luxury. Why should utility owners be exempt from the commercial pressures of real world markets which do not embed guarantees that you will earn a rate of return on the replacement cost of your assets? In the real world once you have sunk your cash into a steel mill or a mine, you have to take prices as you find them and you will continue to produce so long as prices cover marginal costs. You hope that over the long run, between swings in prices, you will earn a return of capital and a return on capital but there are no paternalistic guarantees. So long as you get a hurdle rate of return on your cash outflows you are content, but that is a DAC concept not a DORC concept.

There needs to be critical examination of the arguments for replacement cost valuations such as DORC and whether any value should be attributed to sunk capital (cf Wells and King on scrap value). Arguments used by Professors King, Johnstone, Wells, Bonbright, Whittington and others demonstrate that using DORC provides a “free lunch” in economic terms and challenge the argument that DORC is “economically efficient” (based on Tobin's q ratio).

Johnstone (1999) comments that the “view [that economic theory requires sunk assets to be valued at DORC] has been promulgated and recited by asset owners and the regulators themselves to the point that it is widely taken for granted, albeit without demonstration or authority. And yet the two theorists who have had most of substance to say about the regulatory asset valuation debate in Australia, Melbourne University economist Stephen King and Cambridge economist and accountant Geoffrey Whittington, have both concluded in their published works, and reports to regulators, that DORC should not be adopted, not simply because of its established impracticalities and administrative infirmities but because it is theoretically not acceptable ... The other, more astounding precedent ignored by regulators who assume the relevance of DORC is that in the USA where asset valuation for the purposes of tariff setting has a 100 year history and a massive literature, replacement cost based asset valuation has been either not taken seriously or considered and rejected. The authoritative American text on asset valuation for regulation purposes, Bonbright et al (1988, pp 296-8) rejects replacement cost valuation as neither living up to its supposed economic justification nor being practically administrable.”

Tobin's q is defined as the ratio of the value of the firm to the replacement cost of its assets. Tobin introduced the q ratio as a way of measuring the level of monopoly power of the firm. In a competitive market, if q is greater than 1, competitors will acquire assets, and enter the market and compete away monopoly rents so that q is driven towards 1. Some have used this argument to suggest that DORC valuations are a proxy for a competitive market outcome. However, as Johnstone (1999, p 34) notes, this argument for DORC is ingenuous. “At a theoretical level, the problem is that potential new entrants will likely not be attracted unless prices are considerably higher than, rather than merely equal to, those based on assets